

Skill shortages in Limburg

Citation for published version (APA):

van Dam, J. W., Ramaekers, G. W. M., & van der Velden, R. K. W. (1991). *Skill shortages in Limburg*. Researchcentrum voor Onderwijs en Arbeidsmarkt, Faculteit der Economische Wetenschappen. ROA Reports No. 3E <https://doi.org/10.26481/umarep.199103E>

Document status and date:

Published: 01/01/1991

DOI:

[10.26481/umarep.199103E](https://doi.org/10.26481/umarep.199103E)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

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SKILL SHORTAGES IN LIMBURG

ROA-R-1991/3E

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Maastricht, March 1991

READERS MANUAL:

- if interested in headlines of the report: see Chs. 1, 11, 12;
- if interested in one specific sector: see case-studies (Chs. 6-10);
- if interested in the regional aspects of the report: see Chs. 2, 3, 6;
- if interested in theoretical aspects of technology and skills: Ch. 5;

This report was financially supported
by the European Commission, Task Force
on Human Resources

CIP-GEGEVENS KONINKLIJKE BIBLIOTHEEK, DEN HAAG

Dam, J.W. van

Skill shortages in Limburg / J.W. van Dam, G.W.M. Ramaekers, R.K.W. van der Velden. -
Maastricht: Research Centre for Education and Labour Market, Faculty of Economic Sciences,
Rijksuniversiteit Limburg. - (Report / Research Centre for Education and Labour Market, ISSN
0922-8098;)

Met lit. opg.

ISBN 90-5321-052-0 geb.

Trefw.: werkgelegenheid; Limburg.

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1. INTRODUCTION

1.1. Background

A pilot project commissioned by the European Commission (Task Force on Human Resources) began, in four regions within the EEC, in the spring of 1990. The objective of this project is:

1. To contribute to the provision of a Community strategy on skill needs and related training requirements over the 1990s based upon factual evidence and examples of best practice.
2. To provide a proven model that will generate realistic and factual information on skill shortages and corrective actions that can be used as a basis for developing Community strategy.
3. To provide this information based on in-depth research through existing infrastructure.

In the autumn of 1990 the project was extended to include some 20 other regions within the EEC. This report, which gives an account of the problems in the Limburg labour market, is a result. The project was undertaken by Jaap van Dam, Ger Ramaekers, and Rolf van der Velden (project manager), all attached to the Research Centre for Education and Labour Market (ROA) in Maastricht.

1.2. Research questions and structure

The following research questions have been formulated:

1. What are the problem areas in the Limburg labour market, today and in the near future?
2. How can education and training play a part in overcoming these problems?

The extent of the research will be limited, first by a focus on the problems that result from technological developments, and second because special attention will be given to the consequences for the skill requirements set for employees at an MBO (Intermediary Vocational Education) and HBO (Higher Vocational Education) level.

The study has 3 phases. In phase 1, general information about the problems in the labour market, especially the Limburg labour market, was compiled. Apart from interviews with key figures in the region, the research in this phase consisted mainly of desk-research. This phase was the basis for the selection of case studies in phase 2.

Phase 2 consisted of five case studies in sectors of the economy, selected for their regional importance, and because they might illustrate interesting ways of dealing with the problems

found in phase 1. On the basis of literature searches and conversations with experts in the region, the following five sectors were chosen:

1. Customs clearance agencies.
2. Office automation.
3. The printing and graphics industry.
4. The metallurgic industry.
5. Medical technology and health care.

Considerations:

- * The regional component of customs clearance agencies makes them an interesting subject. Upon the lifting of the borders in 1992, fundamental changes will occur in this sector. Anticipatory steps have already been taken, with several training projects. Apart from these Euro-regional factors, aspects related to logistic development are important for this sector.
- * Office automation has become wide-spread in the past years. In the first phase of office automation the need for schooling was met by the market itself (especially the automation suppliers themselves). The big challenge for the current and coming phases is that office automation can cause big changes in organisation structure and individual job descriptions. What consequences does this have for the qualification standards set for employees?
- * The eighties saw technological change in both the graphics and metallurgical industries, in the area of production automation. However, the reactions to these developments have been very different in the two industries, as shown, among other things, by the emergence of different training policies. It is interesting to ask what consequences these different reactions have had in dealing with bottlenecks in the supply of personnel.
- * The health care sector is an interesting example of a professionalised sector, in which the training policy is very much determined by the institutions concerned. The enormous oversupply early in the eighties has now turned into an excess demand. Apart from this, important changes have occurred in the duties required of the personnel, partly as a result of technological developments. It should be noted that medical technology forms one of the spearheads of the regional socio-economic policy.

Considering the character of the problems, the case studies are, in part, applicable on a national level. However, in each case an attempt was made to obtain supplementary information from experts in the region. Information was derived from existing statistics, previous research, and conversations with key figures in the sector concerned.

Phase 3 of the project consisted of a seminar to discuss the results of the research, attended by experts from industry, government, educational institutions and research institutes. The seminar formulated policy recommendations.

1.3. Contents

The report consists of three parts. Part 1 (chapters 2 to 5) will give a general description of the problems in the labour market, especially in the Limburg labour market. Chapter 2 will give a socio-economic description of the region. Chapter 3 describes policy-making structures. Chapter 4 describes the educational infrastructure. In chapter 5, a survey of research results and theories in the field of technology and qualification will be given.

Each of the chapters in part 2 consist of a report from a case-study. In part 3, the differences and similarities between the five case-studies will be examined (chapter 11) and the conclusions and policy recommendations will be presented in chapter 12.

PART I: BACKGROUND INFORMATION

2. SOCIO-ECONOMIC DESCRIPTION OF THE REGION

2.1. Introduction

This chapter presents background information from existing sources on the socio-economic structure of Limburg. Section 2.2 provides an outline of the region's demographic and employment profile and section 2.3 of its location. Section 2.4 describes the economic structure.

2.2. Population and employment figures¹

Limburg has a population of approximately 1.1 million, accounting for 7% of the national population. This population is growing at the very slow rate of 0.4% per year (below the national average of 0.6%) as a result of a low birth rate and net migration of approximately nil. For the country as a whole, immigration continues to exceed emigration.

As a result of past birth rates being below the national average, the population as a whole is at present aging more rapidly in Limburg than in the Netherlands. In 1987-'89 the proportion of retired people (age ≥ 65) grew at an annual rate of 3.1% (the national figure is 1.9%). This has an enormous impact on the growth rate of the age group 15-64 and consequently on the growth of the labour force. As a result of low birth rates the number of school leavers and the rate of growth of the labour force in Limburg are declining, gradually but at a rate which exceeds the national average. The decline is more marked because in Limburg this process is not compensated for by a migration surplus as is the case in the Netherlands. In 1987-'89 the labour force in Limburg grew at an annual rate of 1.3% (nationally 1.5%).

Over the period 1987-'89 the annual growth in the labour volume in Limburg has, at 1.6%, constantly been more favourable than the national growth rate (1.2%). As a result of this growth in the demand for labour and the declining growth of the work force, the total unemployment level in the region, which exceeded the national average at the beginning of the eighties, had declined to 13.3% in 1989 (the corresponding national figure was 13.2%). Since 1983 both the level of unemployment and the proportion of long term unemployment in the region have constantly declined. However the reduction in regional unemployment has been more favourable for men than for women. In 1989 regional female unemployment (18.7%) still exceeded national female unemployment (17.0%).

1. This section is based on Economisch Technologisch Instituut Limburg (1983 - 1989).

2.3. Geographical location

Limburg is the southernmost province of the Netherlands. It is bordered in the west by Belgium and in the east by Germany. There are two aspects to its geographic location:

- nationally, Limburg is peripheral as regards geographic location and with respect to the concentration of employment and population in the 'Randstad' (the coastal region in the west of the Netherlands);
- internationally however, Limburg has a central geographic location in the densely populated 'Meuse-Rhine Euro-region'.

As a result the region's economy is more internationally oriented than is the nation's economy, as is indicated by the fact the 25% of Limburg firms are engaged in exporting. The national figure is 20%. The difference is even greater when only industrial firms are considered: here the percentage of exporting firms in the region is 10 percentage points above the national figure (37% versus 27%).

With regard to the Common Market in 1992, command of foreign languages and an adequate international transportation infrastructure will become even more important than they are already, especially for Limburg's economy.

The international transportation infrastructure in Limburg consists of one river, two international railways, four international motorways and one airport. The 'Randstad' is linked with the eastern part of Belgium and the northeast of France by the river Meuse, a motorway and a railway, all running through Limburg, and with the Rhein-Ruhr area by the Rotterdam-Venlo railway and by two motorways. Moreover the port of Antwerp is connected to the Rhein-Ruhr area by a motorway which crosses Limburg. Maastricht Airport is Limburg's terminal for international air cargo.

2.4. Economic structure

In the first half of this century the Limburg economy was dominated by coal mining. In 1965 the Dutch government decided to close the mines, which were public enterprises. As a result the economic base of the region has, since the mid-sixties, shifted radically from coal mining to manufacturing. This process of economic change has been stimulated by an active economic restructuring policy on the part of national and regional governments.

An indication of the region's present economic structure is provided by table 2.1, which

presents figures for the production value and the demand for labour in Limburg, by economic sector. As can be seen, the following sectors dominate the region's economy, both with respect to production value and employment:

- the chemical industry;
- the manufacture of metal products and machines;
- construction and installation;
- the retail and wholesale trade;
- public services.

These sectors account for 44% of the region's production value and 48% of the working hours in Limburg.

Since 1983 the region's economy and hours worked have been growing at a faster rate than the nation's economy. Industry and building activities are growing at a rate above the national average, and industry is more important for the region's employment than is the case for national employment. Limburg benefits from activities such as the manufacture of building materials, the chemical industry, paper manufacture and the printing and graphics industry and the transport and communication sector, all of which are at present rapidly growing. These activities are more highly concentrated in the Limburg economy than in the nation's economy.

Table 2.1. Production value and labour volume in Limburg in 1987

	Production (mln. Dfl.)	Labour volume (x 1000 labour years)
Agri-, horti- and silviculture	2906	4.3
Mining (excl. oil/natural gas extraction)	277	0.7
Manufacture of food stuffs (dairy prod.)	1051	2.3
Manufacture of food stuffs (other prod.)	1789	4.7
Liquor and tobacco industry	358	0.8
Manufacture of textiles	545	2.6
Manufacture of wearing apparel	310	1.5
Manufacture of leather and foot wear	17	0.1
Wood industry and manufacture of furniture	379	2.5
Manufacture of paper	1289	4.5
Printing and publishing industry	754	4.3
Petrochemical industry (incl. oil/natural gas extraction)	6296	18.6
Manufacture of building materials, ceramics and glass	1593	9.1
Basic metal industry	426	1.8
Manufacture of metal products and machines	3922	19.8
Electrotechnical industry	1576	7.2
Manufacture of transport equipment	1863	6.5
Manufacture of instruments and optical products	189	0.9
Public utilities	1577	3.1
Construction and installation	3886	20.4
Wholesale and retail trade	4812	34.5
Hotel and catering industry	929	4.9
Repair (consumer goods)	379	3.1
Sea and air transport	1328	12.0
Communication	586	4.4
Banking	834	4.8
Insurances	1441	7.2
Ownership of dwellings	2549	0.7
Commercial services and rental	1215	8.5
Public services	4151	43.3
Health and veterinary services	2262	24.3
Culture, sports and recreation	399	3.6
Other private services	897	18.0
	-----	-----
Total	52785	285.0

Source: Centraal Bureau voor de Statistiek (1990), *Regionale economische jaarcijfers 1987*, Voorburg/Heerlen.

3. PARTICIPANTS, GOALS AND INSTRUMENTS IN REGIONAL POLICY-MAKING

3.1. Introduction: how to control a rapidly changing regional economy?

Since the mid-sixties the economic base of the region has shifted radically from coal mining to manufacturing and commercial and public services. This process of economic change has been stimulated by an active economic restructuring policy from national and regional governments. New activities have been introduced to compensate to some degree for the employment lost when the coal mines were closed. For example, some public services were relocated from the 'Randstad' (the highly urbanised North-eastern district) to Limburg, and a car manufacturing plant was built with government aid. The national government declared the region a regional development area. The policy involved is described in the *Perspectieven Nota Limburg*. The Provincial government of Limburg, the Regional Boards for Employment Policy ('Arbeidsvoorziening'), and other organisations are supposed to play important roles. These organisations will be described below.

3.2. Provincial government

The Netherlands' governmental structure has three levels: national government ('Rijk'), regional government ('provincie') and local government ('gemeente'). The Province of Limburg is one of the twelve regions, with 69 local government areas. The public policy of the provincial government is partly a result of national policy and partly a result of regional decisions. Regional policy is prepared and carried out by the provincial executive and the provincial administration. Provincial decision-making is the product of provincial political parties, their representatives in the 'Provinciale Staten' (regional parliament) together with the provincial executive. By the "public policy" of the Province we mean the official written policy.

Policy on the regional economy, labour market and education

The labour market and employment policy of the province of Limburg takes the general approach of stimulating and creating favourable conditions for the local economy. From the overall objectives of the Provincial Socio-economic Policy (stimulating regional economic development, advancement of employment and reduction of unemployment) the following facets can be distinguished:

1. *The economic structure policy.* This aims at strengthening growth areas and guaranteeing optimal economic development by making various infrastructural and structural provisions

and by initiating pilot studies and pilot projects. In the 'Provincial Socio-economic Policy Plan 1986-1990' the provincial government put forward a regional socio-economic policy in which seven areas were chosen for special attention:

- transit traffic (e.g. Maastricht Airport and the railway container terminal in Venlo);
- telematics and office systems (e.g. computer services and companies producing photocopiers and other office equipment);
- the chemical refinement industry: DSM, a chemical multinational, is located in Limburg;
- medical technology (R&D, marketing knowledge, and manufacturing);
- tourism (aimed at people living in the region and people from outside the region);
- agri-business (horticulture, production and marketing of necessary equipment);
- energy (R&D and the production of energy-saving materials).

2. The labour market and training policy. The main objective here is to prevent quantitative bottlenecks in the regional labour market, through a provincial educational policy, conducting economic research (or having it conducted), supporting the retraining and further training projects of companies and industries, etc. The Provincial Labour Market Program, which is charged with these tasks, has an annual budget of two million guilders. The national regulations that have to be applied have been added in an appendix.

3. An additional employment and unemployment policy. The 'Provincial Labour Supply Policy' is intended to support projects intended to bring the long-term unemployed, women, school drop-outs and partially disabled persons into the working world.

Shifts in policy emphasis, from 1986 to the present

In the past years three important developments have taken place in the labour market policy:

1. A shift of emphasis from wage subsidies and training subsidies for occupations experiencing shortages, to subsidies for the training initiatives of businesses, in parallel with internal quality-care and the introduction of the 'human resources management' perspective. At present the priority is on putting cooperative agreements organised by businesses or regional schooling arrangements into effect.
2. More attention is being given to the movement of people from vocational education onto the labour market by, among other things, strengthening the relationship between vocational education and the business world, and promoting quality control in vocational education.
3. Promotion of initiatives such as the foundation of the Limburg Institute for Employment and

the Labour Market (SWAL), the Limburg Centre for Company Training (LCB) and the Business Training Advisor (BAO), which have the effect of structuring the labour and training markets. These initiatives are described in more detail below.

The policy plans of 1991 give an important place to these initiatives to structure the labour and training markets. Apart from this, the province intends to (continue to) especially emphasize experimental, international or European, and infrastructural projects in the area of training and the labour market.

3.3. Regional Boards for Employment Policy

As of the first of January 1991, the labour supply policy in the Netherlands has a tripartite structure, with government, employer, and employee representatives taking part, under the Central Bureau for Employment Policy. Such a tripartite management structure for the supply of labour is in accord with the practice in most other European countries. In Limburg this is planned and carried out by two Regional Boards for Employment Policy (RBAs). The main tasks of this new employment policy structure are:

- 1) employment-agency work;
- 2) training;
- 3) information distribution, responding to questions, and advising;
- 4) executing and initiating labour market research.

Sixteen full-time equivalent positions were assigned to the Limburg Regional Boards for Employment Policy for 1990. In addition, the Bureaus of Labour, concerned with the employment-agency part of this policy, have 255 full-time equivalent positions, and there are 103 full-time equivalent places for the Centres for Adult Vocational Education, carrying out the training task. Apart from that, about 3 million guilders have been allocated for material expenses and 49 million guilders for (mainly earmarked) policy expenses by the Limburg Regional Board for Employment Policy. The four tasks mentioned above will have to be carried out with these means.

3.4. Other organisations

1. *Limburg Foundation for Employment and the Labour Market (SWAL)*

The tri-partite Provincial Employment Policy Boards Coördinating Council was established as a result of the provincial labour market and employment policy. The participants are the employer' organisations, unions and government organisations. This council will also act as the board of the Limburg Foundation for Employment and the Labour Market, which aims at

the development, support and execution of projects at a provincial level that are directed mainly at the entry or re-entry of groups which are hard to place on the labour market.

2. Limburg Centre for Company Training (LCB)

The Limburg Centre for Company Training emerged from a merger, on the 1st of January 1991, between the North Limburg Foundation for Company and Vocational Training (SBVL) and the North Limburg Foundation for Vocational Education (SBO). This merger was strongly supported by the province, in the hope that the provincial training market would thus be given a clearer structure.

The Limburg Centre for Company Training is an institute with equal representation from employers, through the Limburg Employers' Association (LWV) and the Limburg Organisation of Independent Concerns (LOZO), and from employees, through federations and unions, with representatives of the Province and the Regional Boards for Employment Policy functioning as advisors without a vote. The Limburg Centre for Company Training maintains contact with associated organisations (such as training funds and government institutes) and the so-called 'major accounts' (the big clients throughout the province). Apart from this, the provincial centre will, if necessary, coördinate the activities of the four regional Centres for Company Training. Each region has a regional manager with a small staff and a discretionary budget. The main task of this regional manager is to initiate training projects for companies. In this he may be assisted by the Business Training Advisors (BAOs), who also operate regionally.

3. Business Training Advisors

In 1988 the Business Training Advisors project was initiated. The task of these advisors is to stimulate the realization of sector and regional cooperative training structures. The Business Training Advisor is charged with identifying and defining the training needs of companies in the region and the initiation or stimulation of training projects to serve these needs. According to the Province, the Centre for Company Training should function as a service institute for the four Business Training Advisors who began to operate as of January 1st 1991. The Province has allocated a total of 400,000 guilders in subsidies for the Business Training Advisor project, for a period of three years. A fifth Business Training Advisor works in particular with the Institute for Small and Medium-size Businesses (MKB) in the whole of Limburg, and operates from the Limburg Centre for Company Training.

4. Contact Centre for Education and Labour (COA)

Every province has a Contact Centre for Education and Labour. This is a cooperative structure of representatives of education, business, and government, with the aim of

improving the coordination and cooperation between education and labour. To this end, the Contact Centre has an initiating, coördinating, and advising role in the following fields:

- a. the promotion of knowledge of developments and problems in the relationship between the provincial or regional labour market and the education available;
- b. the stimulation of the coordination of activities in the field of school, study and career counselling;
- c. the stimulation of an optimal usage of practical training possibilities, as the best way to bring about direct contacts and interaction between the educational and business worlds;
- d. the coordination, stimulation and initiation of other activities necessary for the promotion of the links between educational and labour structures.

5. *Limburg Industrial development fund (LIOF)*

The 'Industriebank LIOF Ltd', a bank for the industrial development of Limburg, is an important tool for regional industrial development policy. It has an equity of about 110 million guilders and a development fund of about 1.3 million guilders yearly, which can be used for several innovative projects. The funds are managed by a board of trustees who are appointed by the national Ministry of Economic Affairs.

Appendix: Review of Relevant Regulations

Training measures (on the supply-side):

- The 'Programme for Additional Training (PAS)' is intended to stimulate better coördination between government department training programmes and the training initiatives of trade and industry. The elimination of the relative training disadvantage in middle and smaller-sized businesses is central. For this part of the programme 250 million guilders are available at a national level.
- The 'Training Framework' programme (KRS): 12.3 million guilders have been made available for Limburg for the year 1990 for this measure and the 'Government-financed Training of Adults' programme, described below. The KRS regulations focus on the further training of (mainly unemployed) job seekers, so as to be able to place them, via the Framework for Labour Placement (KRA), on the labour market.
- Contributions to Vocational Training and Apprenticeship Regulation (BVL): this sector by sector measure offers the training funds more room to anticipate the specific developments on the supply-side of their sector.
- Subsidies for Centres for Vocational Orientation and Vocational Practice Regulation (CBB): the CBBs look after vocational guidance. The task of the CBBs will increasingly be to provide transition programmes for the unemployed with a weak position on the labour market.
- Implementation Bill for the Basic Law for Adult Education (IKVE): this gives the Regional Boards for Employment Policy a planning function in the government-financed training of adults (PBVE). Through open entry, the utilisation of existing training facilities will be promoted. Furthermore, more efforts will be made to coördinate the training activities of business sectors and companies.
- Project 'Centre Problems': started early 1989, this project should improve the market positioning of the Centres for Vocational Training.
- Regulation for the Subsidization of the Training of Employees in Trade and Industry (SSWB): this is a regulation of the Ministry of Economic Affairs, intended to stimulate business organisations to make an inventory of the training needs in their sector, and to develop training plans. Four types of activity are considered for subsidy:
 1. the establishment of a consultative structure for training and education;
 2. research into the qualitative and quantitative personnel requirements;
 3. the development of courses;
 4. distributing information in the sector about these aspects. This measure is not meant for individual companies or employees.

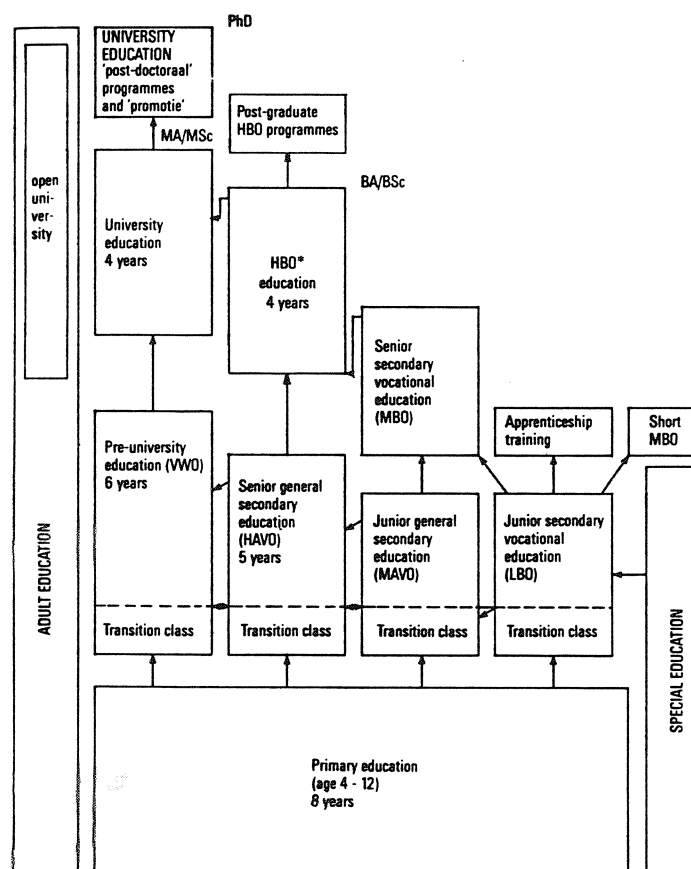
4. EDUCATIONAL INFRASTRUCTURE: THE NETHERLANDS AND LIMBURG

In this chapter the educational infrastructure for vocational training in the Netherlands and Limburg will be described. We also make an international comparison and note the policy-plans for education of the regional government.

4.1. Vocational education and apprenticeship in the Netherlands

Like most other European countries, a distinction is made in the Netherlands between general- versus job-oriented education. In this report we pay almost exclusively attention to job-oriented education and training. As shown in the diagram of the Dutch education system vocational education ('Beroeps Onderwijs') takes place at three educational levels: the level of junior vocational training (LBO), the level of senior vocational training (MBO) and the level of higher education (vocational colleges (HBO) and university (WO)).

Diagram of the Dutch education system



* Note: Dutch government publications in English refer to HBO (hoger beroepsonderwijs) as Higher Vocational Education. The HBO institutes themselves prefer the term Higher Professional Education.

Source: Nuffic, 1989

Table 1 shows that the share of vocational education (including universities) in total regular education is highest in the Netherlands and Sweden and relatively low for the United Kingdom and Japan.

Table 1. Proportion of dual-system students in total population between the ages of 15 and 24

	1983 %	1984 %	1985 %	1986 %	1987 %	1988 %
The Netherlands	2.5	2.4	2.3	2.3	2.3	1.9
France	2.6	2.6	2.5	2.4	2.6	2.8
(West) Germany	10.0	13.5	15.5	17.7	17.4	17.7
United Kingdom	7.6	5.0	5.6	4.8	4.9	5.3
Italy	0.5	0.6	0.5	0.6	0.6	0.6
Belgium	2.3	1.9	1.8	1.9	1.6	1.3
Luxemburg	5.8	6.3	7.0	6.1	5.7	5.1
Ireland	2.8	2.2	2.5	2.0	1.9	--
Denmark	7.4	18.8	22.1	22.7	23.7	23.8
Greece	0.3	0.3	0.4	0.5	0.3	0.3

Source: Eurostat/ILO/ROA

Job-oriented training is also given in the dual education system, in the Netherlands best-known as apprenticeship training. As shown in table 2, in the Netherlands the share of pupils following dual education is very low, and declining, compared to West-Germany and Denmark.

Table 2. Indicator of the share of vocational education (second and third levels)

	1975 %	1980 %	1981 %	1982 %	1983 %	1984 %	1985 %	1986 %
The Netherlands	51	53	53	54	55	55	56	57
United States	--	--	--	--	--	--	--	--
Japan	34	32	32	30	30	29	28	28
France	35	36	36	40	38	39	36	40
(West) Germany	32	33	35	37	29	31	32	48
United Kingdom	16	18	19	19	20	23	24	26
Sweden	45	45	46	49	51	51	--	50
Austria	25	33	33	35	37	40	41	54

Source: UNESCO (1984, 1985, 1986, 1987)

Legend: -- = not available

Skills are also generated by the government, commercial training institutions and firms which offer firm-specific training courses for their own workers. It is estimated that in 1986 about 800.000 persons in the Netherlands followed a firm-specific training course (Boot, 1988).

4.2. Vocational education in Limburg

As commercial training institutions are rare in the region and little research has been done with respect to the generation of skills by firms in the region this section is limited to the generation of skills provided in Limburg by the government.

Junior vocational training

1. Offered by the Ministry of Education and Sciences:

- junior technical training;
- junior retail trade training;
- junior economic and administrative training;
- junior agricultural training;
- home economics training.

2. Offered by the Ministry of Social Affairs and Employment:

- technical vocational training for adults in the fields of building and metal working;
- administrative vocational training for adults.

Senior vocational training

Limburg has 28 schools for senior vocational training, with a total of about 19,000 pupils:

- 5,000 in economic and administrative training;
- 5,000 in technical training (in the fields of energy-technics, electronics, mechanical engineering, processing technics, precision engineering);
- 5,000 in service and health training;
- 3,000 in retail trade, hotel and catering training;
- 1,000 in laboratory and agricultural training.

Apart from that, many schools in Limburg offer the possibility of shorter senior vocational training, with courses in the fields of metal working, retail trade, (medical, welfare, external) care, automobile technics, processing technics, administration, electrotechnology and in the hotel- and catering business.

Higher education

Higher education in Limburg consists of nine vocational colleges and two universities with a total of 23,000 students.

1. *Vocational colleges (departments between brackets)*

- one in Venlo (technical-college, administration and economics, teacher training for primary

schools);

- one in Roermond (teacher training for primary schools);
- one in Heerlen (technics, administration and economics, socio-pedagogic, teacher training primary schools);
- three in Sittard (technics, administration and economics, teacher training for primary and secondary schools and socio-pedagogic training);
- three in Maastricht (administration and economics, teacher training for primary schools, socio-pedagogic training, music, theatre and fine arts, hotel and restaurant management, and languages and translation).

The total number of students in the nine vocational colleges amounts to approximately 14,000. An ETIL study came to the conclusion that about 5,000 students in the school year 1987-'88 participated in post vocational training/contract training offered by vocational colleges in Limburg, especially in the fields of teacher training and economics (ETIL, 1989).

Within three of the nine vocational colleges contract activities are incorporated in a professional structure. In three more colleges such structures are envisaged.

2. University education

- The 'Open Universiteit' in Heerlen which can be compared with the Open University in the UK. Part time studies are offered in modular form in the fields of law, economics, science of public/social administration, technical sciences, natural sciences, culture and social sciences. It is the only open university in the Netherlands.
- The 'Rijksuniversiteit Limburg' in Maastricht, a state university consisting of five faculties: medical, health sciences, economics, law, and a general faculty. The total number of students is approximately 6,000.

The university has a science park and a bureau for transferring research results to society.

4.3. National and regional education policy

In the sixties and seventies there was an explosive growth in student numbers as higher education, in particular, became accessible to a whole new strata of the Dutch population. In the eighties this trend was reinforced by growing awareness that highly trained personnel would be the key to economic success in a future of rapid technological development. This coincided with an increasing rate of unemployment and efforts to reduce the budget deficit by cutting public spending. For education this has led to an increasing demand for greater relevance to society. At the same time that it is urging greater efficiency, the government is detaching itself

further and further from any direct involvement in teaching, research and administration.

Despite these developments the provincial government still has certain tasks and responsibilities in the field of education and training (see chapter 3):

- the planning of the educational infrastructure;
- the planning and financing of adult education;
- stimulating higher education and providing a knowledge-infrastructure;
- stimulating the coöperation between education and the labour market.

In practise, this means that the province is stimulating all initiatives, taken by organisations 'in the field', which are intended to improve the intermediary- and non-governmental infrastructure.

5. TECHNOLOGY, QUALIFICATION, AND TRAINING

5.1. Introduction

This chapter will give a general introduction to the field of research. Section 2 will present a typology of the possible discrepancies which can occur as a result of technological developments. Section 3 will explore the effects of technological development on the employment structure. Section 4 concerns the role of training in the recruitment and selection policies of employers. Section 5 will review the anticipated discrepancies in the Limburg labour market.

5.2. Discrepancies in the labour market

The discussion of the effects of technological change is often strongly focused on possible skill shortages. This project may also be considered to reflect this preoccupation, given its title "The EC Skill Shortages Project". However, it should be borne in mind that technological developments may give rise to a broad range of discrepancies in the labour market. These problems may appear in various forms for both supply and demand side of the labour market. In principle, the following discrepancies may be distinguished (Van der Velden et al., 1987):

Table 1. Typology of discrepancies

Discrepancies	Demand	Supply
absolute discrepancies	shortages	absorption problems
relative discrepancies	substitution problems	mobility problems
'brokerage' problems	recruitment problems	problems in finding vacancies
distribution problems	selection problems	displacement problems
utilization problems	over, under, or incorrect utilization	over, under, or incorrect utilization
content discrepancies	coordination problems	coordination problems

Absolute discrepancies occur when the total supply does not equal the total demand. According to the Central Bureau for Statistics (CBS) there were 350,000 registered unemployed in the Netherlands on March 31st 1990, of whom 195,000 had been unemployed for more than one year. The number of unfilled vacancies on the other hand was only 134,000. This means that there is still a considerable absorption problem. On the basis of an extensive study of literature on the effect of technological developments on employment, De Wit and Hovestadt (1990) anti-

icipated that technological development would lead to an increase in productivity growth. The accompanying loss of jobs will be partially compensated for by new employment. However in some business sectors and regions there will be a loss of employment.

Relative discrepancies - a situation in which there is a surplus in one sector and shortages in another - are also expected to increase as a result of this variation in absorption capacity between sectors and regions. On the demand side, this problem will manifest itself as a substitution problem: can a certain position be filled by a worker of another category? On the labour supply side it is especially a problem of mobility: the degree to which workers can move to other functions. The possibilities of moving to other functions vary between training categories.

'Brokerage' problems refer to impediments to contact between supply and demand, for instance as a result of inadequate information. On the supply side, problems in finding a position arise because the labour market is becoming less transparent: it is unclear what the requirements for a new function are, what prospects they offer, etc. On the demand side, a recruitment problem arises because the training market is also becoming less transparent: there has been a proliferation of training categories and courses. The new information technologies do on the other hand offer great possibilities for making the labour and training markets more transparent.

There are *distribution problems* when the number and quality of the available jobs are not equally divided over the various supply categories (Hövels, 1985). For the supply side, this problem occurs as a displacement problem: highly trained workers displace the less trained, for instance. On the demand side it is a problem of selection: given a differentiated supply on the labour market, what order of preference has to be applied in selection? It looks as if the greatest problem in the coming years will be to prevent the weakest categories in the labour market (long-term unemployed, cultural minorities, and the poorly trained) being permanently excluded from the new information era.

These four problem areas were related to the interplay of supply and demand on the labour market. The last two discrepancies in table 1 only occur after supply and demand have acted in the market, since they occur within the work situation. For the labour market, therefore, these are hidden discrepancies.

Utilization problems refer to the degree of under, over, or incorrect utilization of the qualifications of employees. This occurs when someone occupies a post at a higher or lower level than his training prepared him for, or when the direction of the training does not relate at all to his

function. In the following section it will be seen that the rise in the average level of employment positions has not kept pace with the rise in the level of training. Research on the introduction of new technologies also indicates that there is a greater likelihood of under-utilization problems.

Content discrepancies occur when the qualifications transmitted by the educational system do not match the qualifications which a job requires. Note that it is only sensible to discuss this when there is no utilization problem; in other words, when the post filled is one for which the training was intended to prepare. It is clear that technological developments will be a structural source of discrepancies of this kind in particular, because of the continuing occupational changes.

5.3. Technological development and employment structure

In the seventies, discussion on the effects of technological development was dominated by advocates and opponents of the upgrading theory. The advocates argued that work is becoming increasingly complex as a result of technological development. The requirements set for employees will therefore be ever higher, which would result in a general raising of the required training level. The opponents on the other hand supposed that as a result of technological development work will become increasingly routine, which would have the effect of lowering the required training level (the downgrading theory). Another variant is the polarization theory, which suggests that higher as well as lower functions will expand, at the cost of middle management functions.

Empirical research by Huijgen et al. (1983) and Huijgen (1989) into the development of the qualitative structure of employment in the Netherlands shows that the average skill level has risen, on balance, over the period 1960-1971. However for skilled and unskilled manual workers and for non-manual employees, considered separately, the average skill level has fallen (the positive net effect is caused by a shift in the mix of manual and non-manual workers). In addition, a certain polarization of the occupational structure seems to have occurred in this period. This polarization continued in the period 1971 to 1977, while the average skill level remained practically the same. In the period of 1977 to 1985, the average skill level again rose substantially. This rise appears to have been caused especially by shifts in the employment structure within sectors, and hardly at all by shifts between sectors. Sector by sector and international research (Aalders, 1990) points in the same direction: in general there is a rise in the skill level, often linked to polarisation of the occupational structure.

Theories suggesting unambiguous effects of technological development on the employment

structure can be considered naïve, because of their static and deterministic character (Van Hoof & Dronkers, 1980). In the first place, there appears to be rather a large gap between technological development on the one hand and the pattern of the division of labour on the other hand. It seems to be a question of 'organisational choice' rather than 'technological determinism'. The division of labour and the related qualitative structure of employment are determined not only by the technological level, but also by factors such as competitive position, labour market relations, and strategic management behaviour.

In the second place, it seems to be sensible to consider the effects of technology on employment structures from a dynamic perspective. Flynn (1988) points out that the introduction of new technology requires high-quality labour. Unfamiliarity with new technology may mean that, in the early phases, personnel training requirements are set too high. Over time, there will be a certain standardization of activities and the level of qualifications required will go down. The effect of technological development on the employment structure is therefore determined to a large extent by the phase the company is in.

A number of recent studies give a more discriminating view of the consequences of technological developments. Hövels et al. (1988) show that technological developments in the actual practice of professional engineers have led to a broadening of the qualification requirements: there is more focus on other disciplines (in particular computer science), while maintaining the disciplines typical for the profession. Furthermore, higher requirements are set for general skills, for instance problem solving abilities, application to work, flexibility, communication skills and commitment. The technological developments have led to higher training requirements. Note, however, that vertical substitution possibilities (in this case: displacement of less skilled workers by more highly trained employees) seem to be determined mainly by the supply and demand ratio on the labour market.

Alders et al. (1988) have done research in the machine construction and processing industry. In these industries, training requirements for machine operators and process operators seem to have shifted from a Lower Technical (LTS) to an Intermediary Technical (MTS) level as a result of the introduction of computer controlled (CNC) machines. In actual practice, this appears to cause problems in the supply of personnel. MTS students appear to be mainly interested in middle management functions; it is difficult to recruit them for production functions. On the one hand, companies could solve this problem by separating certain tasks, thus creating a distinct function for MTS-trained employees while the remaining tasks are performed by LTS-trained employees. On the other hand, companies could recruit experienced employees with LTS training who would be given further in-service training. The study has shown that a number of

companies who followed this latter strategy are satisfied with its results: in retrospect, their estimate of the required training level proved to have been too high.

Muysken et al. (1990) have done research in four sectors: banking, construction industry, chemical and rubber industry, and the wood and construction material industry. In general, technological innovations seem to lead to savings in labour, which are sometimes substantial. Demand-related factors may however be important in compensating for (or enhancing) the negative effect of increased productivity on employment. The growth in volume of transactions, for instance, has compensated for the negative effect of automation on employment in the banking sector. The occupational structure has remained relatively stable. Major changes do seem to have occurred in the structure and content of the work. There is a visible trend towards task integration and flexibility. Less accent is put on specific professional skills and more on skills such as learning ability, ability to take responsibility, and flexibility. This requires a reassessment of the training level. The conclusion is that the presence of sufficient highly trained personnel increases the rate of introduction of technology.

The increased importance of more general qualifications is not due to the introduction of new technologies alone; the drastic changes in the market are also important. The shift from a 'seller's market' to a 'buyer's market' makes other demands on a business: the life cycle of products is shorter, there is more diversification and more is demanded as regards the terms of delivery and product quality. A business organised on Taylorist principles would be too rigid to comply with these new market demands (Labour Market Report, 1990). The central ideas in modern work organisation are: less hierarchical organisation of work, decentralization of responsibilities, integration of tasks, maximum employment of available human resources, quality control, and innovations in logistic management (Just-in-Time). Broad deployability, flexibility, and client-orientated thinking are important skills.

Muysken et al. (1990) have formulated the theory that the introduction of information technology has led to a shift from sector-specific technology to more generic technologies (e.g. PC's, robots) not bound to a particular sector. Parallel to this development, labour has acquired a different character: from product-related, more manual labour to process-related, more non-specific labour. The research results appear to give this theory some support. It should, however, be noted that there will always be a certain amount of product-related labour and that the boundary between process and product-related labour cannot always be clearly defined. The shift to more process-related labour could, according to several authors (Hövels et al., 1988; Mandon, 1988) result in dissolving the boundaries between occupations and the disappearance of the strict line between, for instance, administrative and production work. This would mean

that the possibilities of substitution and mobility in the labour market would increase. The empirical results do not as yet confirm this: from research among engineers with a Higher Technical training (HTS) it appeared that horizontal substitution possibilities (especially between electric and mechanical engineers) have not significantly increased (Hövels et al., 1988), even though a broadening of the qualification requirements was noted.

5.4. The training costs model

As we have seen above there appears to be a tendency to demand ever higher qualifications. There is a paradox here, in that this development towards higher training requirements seems to be going hand in hand with an increasing under-utilization of qualifications, and the displacement of highly trained workers by those less highly trained. The literature generally points either to the large supply of highly trained workers, meaning that employers can set higher demands without problems, or to the uncertainty which technological developments entail, meaning that employers temporarily make higher demands (See section 3). Both explanations can in principle play a part, but they underestimate the importance of training in the process of recruitment and selection.

When recruiting personnel, employers have only a limited idea of the possibilities and productive skills of the candidates. They will therefore seek 'screening devices' that give information about these productive skills. Perhaps the most important screening device is the training background of the candidate. According to Thurow's 'labour queue' thesis (1975), employers place candidates in an imaginary queue on the basis of expected training costs. First in the line are those that are expected to cost the least in terms of training, and those expected to cost the most go last. A person's training background therefore largely determines his or her position in the queue.

In fact, one could say that not only individuals, but also training courses, occupy a certain labour market position. The question now is, what determines the relative position of a training course on the labour market? Glebbeek (1988) indicates that for large parts of the labour market - those sectors facing efficiency pressures - the relative position of a training course is determined by the expected training costs of the graduates. He sees these training costs as the total effect of a number of components:

- * exclusivity: the extent to which a kind of training has an advantage in the exclusive supply of the required skills for a certain function;
- * mediocrity risks: the extent to which the graduates vary in terms of their control of the required skills, in combination with the sensitivity of the function to this variation;

* learning ability: the average expected learning ability of the graduates of a given kind of training.

The labour market position of a training variety is better when its exclusivity is high, the mediocrity risk low, and learning ability is good. Conversely, the less advantage a training offers in the exclusive supply of the required skills, the more sensitive its labour market position will be to indications of the learning ability and quality variation of its graduates.

This training costs model, a synthesis of elements from the human capital theory and the screening theory, may give an additional explanation of the paradox noted above. Technological development leads to the creation of new qualification requirements, qualifications not immediately supplied by the existing training channels. Therefore there are no courses focused on producing the qualifications for which a demand exists. This means that indications of learning ability become more important, because the desired qualifications will have to be taught 'on the job'. This causes an upward pressure on the required training level, because this is a good indication of the learning abilities of candidates. From the point of view of the demand side it is a rational decision, but for the supply side it entails the danger of under-utilization.

A parallel development is that, in certain sectors, substandard functioning of graduates becomes more a matter of concern as a result of technological developments. The risk of damage has increased. When there is a large variation in the degree of mastery shown by graduates, this has negative consequences for the market position of all graduates, even if the average level of mastery is sufficient. This factor also leads employers to set higher educational requirements, resulting again in an increase in under-utilization problems.

The advantage of the suggested model is that it shows why technological developments lead to a rise in training requirements. At the same time, the model can also be used to indicate which strategies a training course could use in order to react to these developments. What steps can those offering a training course take to safeguard its market position and how can this process of diploma-inflation be stopped? Two solutions are evident on the basis of the model. First, they can focus on the more exclusive supply of the qualifications required. By changing the curriculum, they can try to offer a course which is made-to-measure for the current demands of the labour system which is their customer. In so far as they can meet their customers' needs more precisely than other alternatives, they will obtain the benefits of exclusiveness. This solution seems to be important especially for those offering training at the lower end of the educational system, for whom exclusiveness is the only way to compete with other training courses. However whether or not this is possible depends to a large extent on the rate of technological change and the response time required from the educational system. It is perhaps

more important therefore to try to increase learning abilities and reduce the risk of mediocrity. In other words, those offering training should pay more attention to quality control. This can be achieved by more rigorous selection criteria, on the one hand, and by giving extra attention to weaker students on the other hand, so as to be able to guarantee a higher minimum level.

5.5. Educational shortages in Limburg

At the request of the provincial government, the 'Economisch en Technologisch Instituut Limburg' (ETIL) conducted a survey in 1986 on skill shortages with regard to the key sectors named in the provincial socio-economic development policy (Van Camp, 1986). The survey was restricted to skill shortages as experienced by companies in the key sectors of transport, telematics and office systems, the chemical refinement industry, medical technology, tourism, agri-business and energy. These sectors accounted for only 11% of the region's total employment in 1983.

Quantitative shortages were experienced at different educational levels and in various fields of skills.

- * University level: information science, chemistry, chemical technology, physics, technical physics and electrotechnology.
- * Vocational college level: informatics, chemical technology, technical physics, technical computer science, electrotechnology, mechanical engineering and business administration.
- * Senior vocational level: processing technology, all-round maintenance technology, transport, biochemistry, horticulture, electrotechnology, mechanical engineering and business administration.
- * Junior vocational level: electrotechnology and mechanical technology.

Unfortunately these shortages were not quantified in the ETIL survey.

Qualitative shortages were found with respect to one-sided courses, insufficient command of languages and an inadequate policy relating education and the labour market.

On the basis of these findings the ETIL-institute put forward the following recommendations to the provincial government:

- * expanding the training capacity in the fields of study where quantitative shortages are experienced;
- * improving curricula, especially with regard to knowledge of adjacent fields of study, management skills and the handling of modern equipment and computers;
- * improving the command of foreign languages;

- * encouraging the mutual formation of policy between the education and labour markets;
- * providing professional labour market orientated vocational information.

A comparison of the higher educational infrastructure in Limburg with the economic structure shows up a number of points of mutual reinforcement and spin-offs (Van Essen, 1989):

- the course in 'Logistic Management' at the 'Hogeschool Venlo' correlates with Venlo's role as a major overland transportation centre (e.g. railway container terminal) in the Netherlands;
- the development of the telematics complex (telecommunications/informatics) in Limburg, corresponds with the availability of technical and economic education (computer/ communication/information studies and management studies);
- the presence of a substantial chemical industry in South Limburg (notably the Dutch State Mines), correlates with the chemical-technological studies offered at the 'Hoge school Heerlen';
- a major medical rehabilitation centre in Heerlen and medical technological activities in Maastricht (industry and the 'Rijksuniversiteit Limburg') complement the medical and paramedical studies at the 'Hogeschool Heerlen' and the 'Rijksuniversiteit Limburg';
- the internationally central location of Limburg dovetails with the 'Hoge Hotelschool Maastricht' (hotel management studies) and the 'Rijkshogeschool, Opleiding tot Vertaler'(translation and interpretation studies) in particular;
- the development of the tourist industry in the region is interrelated with the presence of the 'Hoge Hotelschool Maastricht'.

In meeting the demand for skills, Limburg faces the following challenges:

- a dramatic decline in the number of school leavers (down 30% within the next ten years), which increases the need for continuous training of the existing work force in order to make best use of human resources;
- the challenge of coping with technological development especially with respect to computerization, production automation and new materials;
- the challenge of meeting the demand for skills necessary to cope with tele-informatics and medical technology, which are two important areas of the region's economic development policy;
- the challenge of meeting the demands of the Common Market, especially since the Limburg economy is relatively strongly export oriented, being located in the centre of the 'Meuse-Rhein' Euro-region.

PART II. CASE STUDIES

6. CUSTOMS CLEARANCE AGENCIES

6.1. Introduction

The customs clearance agent derives his function from the controls and formalities that have to be complied with at borders. This function will be increasingly eroded as more and more border controls and formalities are shifted from internal borders to the external borders of the EC as a result of European integration policies. Moreover, the border will no longer be the necessary place of business. Although the transport and freight forwarding sector as a whole is expected to benefit from the lifting of border formalities, the future looks dark for customs clearance agents. Customs Offices at the border are already closing down. A study by the Limburg Institute for Business and Economic Research (LIBER) has shown that 300 to 400 jobs may be lost in the Limburg customs clearance sector. It seems inevitable that customs clearance agencies will have to focus on new activities (Van Witteloostuijn, 1987).

This chapter describes the developments which have an influence on the future function of customs clearance agents, the problems that arise and the strategies that are employed to tackle these problems.

6.2. Definition¹

A freight forwarding agent has goods transported by order of a third party and performs related activities, such as customs entry and clearance, insurance, bonded store arrangements, transshipment and the like. He is therefore an intermediary between the one who offers the freight (the consignor) and the one who offers the freight capacity (the conveyor).

A freight forwarder, as an organizer of transport, also occupies himself with customs declarations if necessary, but a customs clearance agent derives his function solely from the formalities and controls that have to be complied with at national borders, due to the differences in legislation between countries. The formalities and controls relate to:

1. the transported goods, in so far as taxes, excise duties, levies, etcetera are involved;
2. the vehicles, in as far as transport permits, technical traffic requirements, etcetera are involved;
3. other matters, such as sanitary, veterinary, agricultural requirements and quality standards.

In his work the customs clearance agent is mainly concerned with the formalities and controls

1. This section is based on Gianotten (1987).

mentioned under 1. Although these formalities could also be complied with at the final destination of the goods, the goods are generally declared at the border crossing-point. Activities arising from border formalities warrant a choice of location directly on, or at a short distance from, the crossing-point. Customs clearance agents may be working for cross-border road, rail, sea, air, or inland waterway transport. The custom agents who specialize in cross-border road transport form the most important category.

Apart from specialized customs clearance agents, customs declarations and border formalities are also done by freight forwarders, stevedoring companies and other intermediary agencies. Over 30% of these regularly take care of customs formalities. For freight forwarders, this figure is as high as 58%. There are also an unknown number of freight forwarding agents and customs clearance agents working in consigning businesses.

At the moment there are some 280 companies in the Netherlands which have freight forwarding activities as their main activity, with a total of 7400 employees, working in 465 locations within the Netherlands.

There are about 95 customs clearance agencies in the Netherlands that specialize in road transport, working from approximately 140 offices. 90% are independent companies. Customs clearance agencies consist mainly of small-sized businesses: in 20% of the agencies, only one person is employed; 55% of the agencies employ 2 to 10 persons and in 25% of them 10 to 100 persons are employed. There are no customs clearance agencies with more than 100 employees. The companies employ an estimated 1050 persons. The total turnover of the Dutch customs clearance agencies specializing in road transport amounts to approximately 125 million guilders.

6.3. Situation Outline

6.3.1. Infrastructure in Limburg

Physical infrastructure

As mentioned above, customs clearance and freight forwarding agencies are usually located directly on, or at a short distance from, border crossings where important international arterial roads enter the country. The Rotterdam-Venlo railway is the Netherlands' main east-west link for goods transport by rail: more than half of the import and export rail traffic in the Netherlands crosses the border at Venlo. The E34 motorway connects the port of Rotterdam, via Venlo, directly with the German Rhein-Ruhr area, while the E39 motorway connects the port of

Antwerp, via Heerlen, directly with the Rhein-Ruhr area. The remaining two international motorways in Limburg are the E31, which crosses the border with West Germany in Gennep, and the E9 which, together with the river Meuse, crosses the border into Belgium at Eijsden. And, finally, Maastricht Airport is Limburg's international air cargo terminal (Kamer van Koophandel en Fabrieken voor Noord-Limburg, 1989).

Educational infrastructure

Because the Venlo region has long been a distribution point, the educational infrastructure for the transportation and freight forwarding field has been well developed. A wide range of regular full-time and part-time education, and block courses, mainly aiming at lower and middle management training, has been developed. Appendix I of this chapter contains an overview of the region's educational infrastructure for the transportation and freight forwarding field.

6.3.2. Importance for the economy of Limburg

The transport and freight forwarding sector is very important for the Limburg economy and employment situation, in particular in Northern Limburg. This is due to the region's geographical location, between the conurbation of Western Holland (the Randstad) and Germany. At the end of 1988, Limburg had 873 businesses in this sector, providing 7400 jobs (2.2% of the Limburg work force).

As for the freight forwarding sector, road transport and air transport agents in particular are important for Limburg. The air transport shipping agent is mainly occupied with cargo assembly and customs and excise services. Transport to and from the airport is also an important activity. For the road transport forwarding agent, cargo assembly and customs and excise services are also important activities, but brokerage, transit handling and the storage of goods are more important than is the case for the air cargo forwarding agent.

A lot of employment in the freight forwarding sector arises from border formalities, such as the customs clearance of goods, V.A.T. requirements, and storage. These duties are usually performed by customs clerks (import/export clerks) who operate from a location immediately on the border. In the province of Limburg there are some 600 persons working as import/export clerks for specific customs clearance agencies.

6.4. Trends, problems and strategies

6.4.1. Trends

There are two trends which erode the function of customs clearance agent: continuing European integration (see section 6.1.) and automation of the Customs Service. In 1980 the Dutch Customs Service began work on the introduction of the 'System for the Automatic Data Processing of Import Declarations with Utilization of Terminals in making Declarations' (SAGITTA). This system for Electronic Data Interchange (EDI) was introduced in phases: computer processing of data constitutes the first phase. The subsequent phases comprised working with integrated tariffs, allowing freight forward agents to make declarations through computer terminals, integration with other Customs Service activities (verification and control), and, finally, connection with the external data processing of government and semi-government institutions. For the customs clearance agency the system leads to electronically submitted declarations and reduced administrative activities. Following on from the introduction of SAGITTA in 1989, the procedures for export declarations and the declaration of transportation documents will also be automated. Furthermore, integration of the computer systems of the EC Customs Services is a medium term objective (SIBAS, 1986).

Customs clearance agents can only survive the consequences of the pursuit of European integration by better meeting the desire of the consignors to reduce border delays to a minimum. This requires more efficient management, backed up by developments in the field of computerization and by a greater readiness to cooperate with each other. It appears that in the long term, when integration of the computer systems of EC Customs Services occurs, and goods declarations are computerized, the position of the customs clearance agent will be further undermined. The long-term strategy then lies in restructuring the service package. A national survey among intermediaries between consignors and conveyors, carried out by the Economic Institute for Small and Medium-sized Businesses (EIM), shows that almost 75% of customs clearance agencies see the abolition of the internal borders of the EC as a serious threat. In this respect, approximately 30% of the agencies take the view that their sphere of activity should be extended to include the entire physical distribution process (a development from customs clearance agent to freight forwarding agent); almost 10% do not share this opinion, while 65% have no opinion. A mere 5% think that the sphere of activity should be widened to include the transport of goods (from customs clearance agent to conveyor); 50% do not share this opinion, while 45% have no opinion on the subject (Gianotten, 1987).

Extending the sphere of activity from customs clearance to freight forwarding and maybe even

transportation can not be seen separated from trends in logistics:

One trend is that production for an anonymous market (a seller's market) is giving way more and more to order-directed production (a buyer's market). Production for stock is therefore decreasing. In order-directed production it is necessary that the flow from raw materials to final products passes off smoothly. Logistics are therefore becoming increasingly important in the production process. Logistics is understood to embrace the complete process of the planning, direction and control of the flow of material and the resulting flow of information (De Leijer, 1988, pp 33).

Another trend is that the physical distribution of raw materials, goods in progress and final products, that was once managed by the large manufacturing companies themselves, is now increasingly contracted out to specialized transport and freight forwarding agencies. Tasks that in the past were undertaken by the consigning company (e.g. planning, storage, stock management, material handling, order entry, quality control, etcetera) now fall to the transport and freight forwarding agency which must operate advanced automation systems for EDI in order to cope with these new tasks. For the smaller agencies, which make up the larger part of the customs clearance agency sector, it is especially hard to make provision for these new developments, which require extensive investments. Cooperation between companies in the same field is therefore unavoidable (Gianotten, 1987).

6.4.2. Problem areas

The integrated European market is expected to be a fact around 1996 and the traditional customs clearance agent will then cease to exist. Until that moment however, employment for customs clearance agents will grow even further, especially as a result of the previously mentioned development from customs clearance agency and freight forwarding in the direction of logistic services. Until 1996 there will be problems from a growing demand for labour coupled with a declining supply as a result of:

- the increasing outflow of import/export clerks (the good ones in particular), who find their function threatened after 1992;
- the continuing declining entry of new staff because of the absence of job prospects after 1992.

One obvious solution is the expansion of the duties of a customs clearance agent to include the duties of a freight forwarding agent or even of a forwarder/conveyor. This would result in two problems. In the first place the customs clearance agent, who has up till now worked by order of the freight forwarding agent, becomes a competitor of his present client. It should be clear

that there is little eagerness in the freight forwarding and transport sector to respond to this development with training measures for customs clearance agents. A second pressure point concerns the uncertainty about the direction in which the duties will have to be extended, considering also the increasing vagueness of the traditional boundaries between the consignor, the conveyor, and the forwarding agent. In addition to this, the fact that shippers increasingly contract out transport and shipment tasks to transport and freight forwarding agencies has led to an increase in the importance that consignors attach to the quality of transport and freight forwarding services.

Quality is also becoming more important as a result of increasing international competition, stimulated by the Common Market. Transport and freight forwarding services in a country such as the Netherlands, with relatively high wages, can only survive this competition by delivering a higher quality. The key notions for higher quality are reliability and speed, epitomised by the 'Just-in-Time' idea, developed by the Toyota Corporation. A just-in-time system '... requires reducing down-time, increasing quality, meeting reductions in tolerances, providing and responding to innovations, adapting to new products and processes, absorbing new technologies and more. The members of the just-in-time system therefore not only need to develop individual and group skills as well as production and technical skills, but also sophisticated systems and trouble-shooting skills to avoid delays and down-time, and intra-organisational learning to ensure the synergism of the system' (Janssen, Justino and Dersjant, 1990, pp 84).

The problem is that up till now, theoretical training in this field has been secondary to gaining practical experience in a work situation. Therefore the number of employees in this field with an MBO education (Intermediary Vocational Education) or HBO education (Higher Vocational Education) is relatively low. This approach to trade qualifications has, thus far, been successful. Considering the trends which were outlined in this section, improvements in the qualifications of current as well as future personnel are essential for the maintenance and growth of employment in this sector (Kamer van Koophandel en Fabrieken voor Noord-Limburg, 1989).

6.4.3. Strategies

Awareness of the trends and problem areas outlined in this chapter has led to the setting up of three projects.

1. The threat to the function of customs clearance agent has prompted the establishment of a training and recruitment project for the benefit of customs clearance agents in Limburg. Section 6.5. will examine this project further.

2. The threatened function of customs clearance agent and the increasing vagueness of the boundaries between consignors, conveyors and intermediaries has led to the initiation of a restructuring project for the Limburg customs clearance agencies. The initiative for this project was taken by the Venlo Chamber of Commerce; at present it is being carried out by the 'Diemen and Van Gestel' consultancy in Tilburg.

The project will be carried out in two phases. The first phase consists of an exploratory study of the anticipated changes of the customs clearance agency sector. This preliminary study, which was started up in August 1990, has almost been completed. It consisted of presenting the following questions to a limited number of companies:

- what developments are expected in relation to customs clearance activities?
- in which way will the company react to these developments?
- what is the opinion of the company on a possible restructuring project related to the sector?

The exploratory study brought to light three levels of optimism:

- soon after 1992, the customs clearance tasks at the internal European borders will disappear;
- this kind of activity will remain for at least another ten years;
- there will always be tasks related to the difference between the EC member states.

There were two different reactions to these developments from individual companies. Some companies are considering closing down, while others want to extend their role. Customs declaration clerks expect that, if the companies do extend their role, it will be difficult for them to fulfill multiple functions without additional training.

Based on the results of this exploratory study the Venlo Chamber of Commerce will decide whether it can give the go-ahead to the second, and most important, phase of the project, which focusses on advising the individual companies that wish to expand their task package.

3. The increased contracting out of transport and freight dispatch tasks by the consigning companies to transport and freight forwarding agencies has led to the drafting of the certificate of the International Standard Organisation 'ISO 1000'. This certificate should guarantee a certain quality control in the logistics services. It has led some transport and freight forwarding companies in Limburg to investigate the consequences of the introduction of this certificate for organisation and training. The financing of this investigation was arranged by the Venlo Chamber of Commerce. It started in September 1990 and is at

present intended to last two years. It is being undertaken by the International Logistics Research Centre (ILEC), attached to the National Academy of Transport in Venlo. The research is being carried out in a large transport and freight forwarding company in Tegelen.

Some preliminary findings

Quality in logistic service means client-centered thinking. To improve the internal and external focus on the client, client-supplier relations within and between companies have to follow set standards. One pre-condition is that non-management personnel have an understanding of the total business process. In terms of training, this means that priority should be given, in the first place, to communication skills, and that more general, process-related skills become more important than technical trade skills (training will be broader). This results in job enlargement for customs declaration clerks, meaning that they will be able to serve multiple functions, and can also fit in more easily in shift work (accessibility enlargement). The required training time is estimated at 50 to 150 hours per year per employee.

Programmes aimed at changing the business culture are necessary for a business policy in which internal and external client-orientation is central, with a corresponding training policy. This is difficult in a sector that has no training tradition and where the tradition of responding to the market has to make way for an anticipatory policy, as regards product-market combinations, because of the fading boundaries between consignors, transporters, and various types of intermediaries.

6.5. Training project for customs clearance agents²

The regional Business Training Advisor (BAO) for North Limburg, attached to the North Limburg Chamber of Commerce in Venlo, has taken the initiative for the pilot-training project for customs clearance agents. He has planned the project in cooperation with the Regional Board for Employment Policy. This project was begun because of the threat to employment for customs clearance agents as a result of the lifting of the internal borders of Europe after 1992. The initiative has therefore not been taken by the sector itself since, as has been mentioned above, the sector consists mostly of small companies, among whom there is a tradition of 'buying away' personnel from competitors, while the 'training tradition' is lacking.

The programme is subsidised as part of the cross-border action programme of the North Rhine-Meuse Euro-region, using both EC money transmitted via the province and the Chamber of

2. This section is based on Kamer van Koophandel en Fabrieken voor Noord-Limburg (1989).

Commerce in Venlo and also money from the Ministry for Social Affairs and Employment, transmitted via the Regional Board for Employment Policy in Venlo. The training project forms part of the restructuring of the transport and freight forwarding sector which is taking place in connection with the trends that were outlined in section 6.4. The project, with a pilot-phase covering three years, aims at offering retraining and continuing education for current and new staff in the customs clearance agency sector in view of the development of the European internal market. The training project has three components:

1. training, retraining, and recruitment of new staff to diminish the work pressure on current staff;
2. in-service training and continuing education for current staff in the customs clearance agency sector to combat high staff turnover;
3. broadening the range of training offered to the transport and freight forwarding sector to make 1) and 2) possible.

6.5.1. The entry of new staff

The EIM-survey mentioned above shows that 29% of customs clearance agencies find the difficulty in filling vacancies to be a bottleneck, and 20% find insufficient schooling facilities a bottleneck. The first component of the training project therefore relates to the (re)training and recruitment of new staff so as to diminish the work pressure in the customs clearance agencies and thus to create room for study leave for the current staff. Therefore enough qualified staff will have to enter, and will have to be trained. Since there is no future for the function of import/export clerk due to the lifting of the internal European borders, the training of incoming staff will have a broader set-up. To this end, two possibilities have been created.

The first possibility is the training as 'Technical Transport Administration Assistant', which started up in 1989. This is a two year basic training as Assistant Freight Forwarding Agent, as part of the apprenticeship system. The responsibility for the contents of the course is in the hands of the 'Stichting ter bevordering van het Leerlingwezen in het Haven- en Vervoerbedrijf in Nederland' (SLHV): Foundation for the Advancement of Apprenticeship in the Harbour and Transport Industry in the Netherlands. In Venlo this training is provided by the Onderwijs Gemeenschap Venlo, with an annual intake of about twenty students. The financing comes from the industry itself. For the practical part of the training, the students make a part-time labour contract with the 'Samenwerkingsverband Praktijkopleiding Expeditie en Transport' (SPOET): Practical Training for Freight and Transport Cooperative. This is a cooperative formed by fourteen larger regional companies in the transport and freight forwarding sector. SPOET was formed in 1988 with the aim of guaranteeing the entry of well-trained young people into

the sector by jointly offering training facilities. SPOET lends out student/employees to the customs clearance agencies. In the SPOET construction two problems were met. Finding good trainee openings and the high level of drop outs. Of the 21 students who started the training in 1989, only 12 have completed the training; 9 students have dropped out prematurely because they had accepted a job in their trainee agencies (6 students) or because of poor study results (3 students). Because of these problems the SPOET-training path is at present hardly ever used.

The second possibility is that graduates and job-seekers up to the age of 30 with a training at Higher General Secondary Education-level (HAVO) can attend a shortened practical training as customs clerk ('Declarant'). This 30-day course is offered, two full days per week, by the 'Algemene Verladers en Eigen Vervoer Organisatie' (EVO) in cooperation with the 'Vereniging van Landgrens Expeditie' (VLE): Association of Cross-Border Freight-forwarders. During the time that the students do not attend school, they train in one of the companies associated with the VLE. After obtaining the nationally recognized certificate, they are employed as a customs clerk in the company where they trained. The employer then guarantees further education. In this component of the project, 27 students started the training in 1989 and 25 of them completed the training.

6.5.2. Training current staff

The second component of the project is the further training and retraining of import/export clerks who are already employed in the customs clearance agency sector. Training is essential if they want to be broadly employable in other functions within the sector after 1992. In order to stimulate this, two measures have been taken.

In the first place, the diverse training possibilities already offered in the region have been made more accessible. A project group appointed to that end, led by the Personnel Manager of the 'Frans Maas BV' freight company, has evaluated a number of existing training institutes for their value for the labour market. Training institutes that sufficiently meet the needs of the sector have been put in the 'Opleidingengids voor Vervoer en Distributie' (Training for Transport and Distribution Guidebook), published in mid-May 1989 and offered to all the companies in the sector. Individual employees in the customs clearance agency business can base their choice of a training course on the range offered in the catalogue. Enrolments for training pass through the Business Training Adviser. It has been agreed with the employers that employees following a course should receive paid study leave. The employer receives a certain amount per hour from a central coördination point as compensation for the loss of productivity from the employee in question. The means that become available in this way can be applied to provide newly

appointed employees with a salary. The further training and retraining of 62 import/export clerks in the Venlo region and 23 in the Eastern Mining Area has meanwhile started.

In the second place, new training for the current staff has been developed. This will be covered in the next section along with the discussion of the third component of the Customs Clearance Agents Training Project.

6.5.3. Broadening of the training offered

As the third component of the project, a broadening of the range of training on offer has taken place. To achieve this, two new vocational training programmes for current staff have been started. The first is the vocational course 'Middle Logistic Management'. This course at an Intermediary Vocational Education (MBO) level is meant for the staff of customs clearance agencies and freight forwarding companies, in particular for import/export clerks and technical-administrative staff. Through this two-year evening course, started in 1990, students may take the Intermediary Business Education (MEAO) certificate 'Business Administration, Materials Management and Physical Distribution'. After taking part in this training, students should be broadly employable as middle management staff in almost all the tasks in the freight forwarding, transport, distribution and logistics field.

At the 'Centrum Vakopleiding voor Administratieve Beroepen' (Centre for Administrative Vocational Training for Adults) in Venlo the training 'All-round Transport Assistant' has started in September 1990. This vocational training is intended especially for employees of customs clearance agencies and freight companies. Through this evening training, extending over fifteen months, students may take the certificates 'Business Economics', 'External Transport Techniques' and 'Logistics'.

6.6. Conclusion

The transport and freight forwarding sector does not have a training tradition: 'buying away' staff from other companies is the prevailing norm. As a result the response to the threatening trends did not come, in Limburg, to any significant extent from within the sector itself, but from a service which mediates between the business and the training institutions: the business training advisor. It is thanks especially to the personal initiative of the regional business training advisor that three projects have been started with an eye to future qualification requirements. These projects are, on the one hand, two research projects aimed at recording the shifts in the demand for labour, and, on the other hand, one training project aimed at increasing and

improving the supply of labour. Without the co-operation of individual businesses within the sector, these projects would not have got off the ground.

Appendix. Education and training³

1. Regular full-time and part-time education in Limburg

In 1980 the National Academy of Transport was founded in Venlo, training students at an HBO (Higher Vocational Education) level to be logistics managers (integrated material-flows manager). In 1986 the Venlo Intermediary Business School, (Puteanus College Venlo, a MEAO institute) was expanded to include 'Intermediary Logistics Management' training. This course is at present also offered by the 'Cobbenhagen' College of Commerce (MEAO) in Heerlen. The Onderwijs Gemeenschap Venlo (a secondary-level institution) provides a two-year full-time Short Intermediary-level Vocational Training (KMBO) for Administrative Assistant in Transport and Freight Forwarding.

The Foundation for the Advancement of Apprenticeship in the Port and Transport Industry in the Netherlands (SLHV) is active in Venlo, offering the two-year basic training course 'Technical Administrative Assistant in Freight Forwarding', one year of follow-on training as 'Assistant Freight Agent' and a one-year, third-level training course as 'Freight forwarder/physical distribution and logistics'. The basic training 'Technical administrative Assistant in Freight Forwarding' and the further course 'Assistant Freight Agent' are also provided at KMBO level by the Onderwijs Gemeenschap Venlo.

2. Block training in Limburg

A. In the field of freight forwarding, transport and distribution:

In 1989 the 'EVO' organisation (covering general consignors and private carriers) in Venlo started their second training centre in the Netherlands, providing the following courses in the field of physical distribution:

- freight Forwarding and Transport within the Netherlands;
- freight Forwarding and Transport abroad;
- distribution Assistant;
- customs clerk ('declarant').

3. This appendix is based on Stichting Samenwerkingsverband Praktijk-Opleiding Expeditie en Transport (SPOET) (1989).

The Centre for Administrative Vocational Training for Adults in Venlo provides a one-year daytime course in 'Transport and Distribution' for the unemployed. The National Organisation for Road Transport and Haulage (NOB) provides training for the certificate of proficiency in 'Cross-border Transport'. Puteanus College in Venlo provides a part-time secondary-level training in 'Freight Transport'. The Higher Business Training Institute provides a one-year 'Transport Course' in Maastricht.

B. In the field of planning and logistics:

The National Academy of Transport in Venlo provides the evening course 'Logistic Management'. The Institute for Vocational Education, in coöperation with Rank Xerox Training, offers the course 'Logistic assistant' with an emphasis on material management.

7. OFFICE AUTOMATION

7.1. Introduction

Office automation is a phenomenon which confronts an increasing number of people in the workplace, especially in a society such as ours, which has become more and more dependent on data processing. This chapter, based on desk research and a number of conversations, sketches the consequences of office automation for work and for training, and discusses two initiatives in the field.

The concept of office automation is explained in the first section. Following sections discuss the changes in functions and training requirements resulting from office automation. Finally the current situation of computerization in companies in Limburg is outlined, and two important training projects are described.

7.2. Effects of office automation

7.2.1. Automation of office work

Office automation starts with learning to employ electronic aids (gaining PC experience and word processing ability). After some time, an office will be completely "automated", meaning that the 'old' secretarial tasks will be performed with the aid of computers. There will be room for the development of new tasks, such as information handling and filing, organizing the data flows logistically and making them accessible to the users, and achieving professional standards in communication with the outside world (Van Bochove & van Eyck, 1989).

In the outline above, the following degrees of computerization can be distinguished (SIBAS, 1986):

1. *Partial computerization*. The activities have been automated separately, but have not yet been computerized in combination. 'Stand alone' equipment (word processor and PC) is used, along with terminals which use a central computing capacity.
2. *Integral computerization*. The data systems have been connected to each other and function integrally. PCs able to communicate with each other via a central computer are used. There is an internal computer network.
3. *Telematization (telecommunication plus computerization)*. Internal computerization is integrated with telecommunication. There are 'on line' connections with various data transmission and communication networks (via telephone, cable and satellite). The importan-

ce of external computer networks will increase, in the light of the trend in organisations to concentrate on their principal functions.

Because of partial computerization there is still a lot of extra training being carried out in areas such as PC operation and word processing. After the first wave of extra training of enthusiastic, generally young employees with an open attitude to this new technology, the current phase is concerned especially with somewhat older employees who take part in technology training more or less out of necessity. The demand for this type of training will decline, since learning how to operate electronic aids has meanwhile been well integrated into basic training. Adaptation to new hardware or software is then more a question of an afternoon of 'instruction' than of extra training. The extra training may be directed more at 'new' administrative needs that arise in an office that has completed the automation process: unlocking of data, filing, managing office logistics, cost management, command of languages. There appears to be room for courses directed at these new tasks, with an entry level of Intermediary General Secondary Education (MAVO) or Intermediary Business Education (MEAO) (Van Bochove & van Eyck, 1989, pp 45).

The effects of integral computerization and telematization on the skills required from staff are determined mainly by an organisation's reaction to technological change, and not so much by the characteristics of the new technology. In a study by the Institute of Manpower Studies, two different reactions were observed, leading to 'job enlargement' (horizontal job extension) and 'job enrichment' (vertical extension). In both cases the emphasis is more on problem-solving skills than on task specific skills (Rajan, 1985). Expert knowledge in the field of finance or insurance, for instance, seems to become less important (Diederer et al, 1989).

As a result of the spread of data processing equipment and the integration of this equipment in data and communications networks, the traditional boundaries between office jobs and production jobs are becoming less clear. Therefore computerization has consequences not only for administrative functions, but to an increasing extent also for operational functions which more and more include computerized administrative activities. It could be hypothesized that the increase in work in the field of information may promote mobility between jobs that have until now been strictly separate as far as career prospects were concerned (Mandon, 1988).

In this survey however, attention is focused in the first place on those users of office automation and information technology equipment who are performing traditional office functions, either because they form part of a specific sector (for instance banking or insurance work) or because they work in administration or provide logistic support to administration.

7.2.2. Changes in office work

In using the new information technologies, the main objectives are as follows:

- to automate processing procedures so far as possible and to replace the physical transfer of information as much as possible with 'real time' transfer, in which distance no longer plays a role (Electronic Data Interchange);
- to offer new products and services to customers, especially in the banking and insurance business;
- to develop new methods of administration and logistic support for the company.

As a result, certain office activities are disappearing, other office activities are changing, and new activities are emerging (Mandon, 1988). Research in the insurance sector (Doorewaard & Huijgen, 1985) has shown that, as a result of automation, some aspects of an employee's function disappeared, while new aspects were created. The reaction of many organisations was to combine functions, creating the 'all-round' insurance worker (increasing flexibility) and to separate the handling of simple cases from that of more complex cases (polarization).

Disappearance of office jobs

The new information technologies and the resulting reorganisations threaten especially unskilled and repetitive jobs. These activities include in particular those that relate to data input, because qualified workers who actual process information are increasingly taking care of data registration themselves. Jobs also disappear in those offices in which, by tradition, a lot of documents circulate or where information has to go by time-consuming routes. The reason for this development is that automated information has to pass through less processing-points than information in the form of documents.

Changes in office jobs

One general development is the breaking down of traditional boundaries between specialized occupational categories. For example:

- Bank clerks are developing in a commercial direction and in the direction of advising clients.
- Secretaries may be given responsibility for the task of the department they work for, for instance personnel management or commercial administration. This may mean that a secretarial career-path can lead to management positions.
- Traditional secretarial activities may in part be shifted to staff employees.
- The role of persons higher up in the hierarchy is shifting from control functions to management functions since they are no longer responsible for routine control and planning activities.

Emergence of new office jobs

The spread of new information technologies leads to the development of new positions which are available for administrative or secretarial staff. This includes jobs meant to make information technologies more applicable for the user, jobs that relate to the control of the information system or to the organisation of the information flows, and jobs involving supporting, or providing instruction for, day-to-day work. The latter have the goal of spreading new skills throughout the organisation and promoting the use of new information technologies (Mandon, 1988).

7.2.3. Changes in educational requirements

Technological developments may lead to higher educational requirements (upgrading) or lower educational requirements (downgrading), or may even have little or no influence on educational requirements. As has been noted before, the consequences of technological changes are to a large extent dependent on the organisational structure of the company. In addition, the relative increase in the number of workers with higher education may to a large extent be the result of an increase in the supply of educated workers, who displace the less educated in their traditional occupational domain. When the need for new qualifications arises, as a result of technological change, businesses may follow a strategy of recruitment, aimed at attracting new personnel, or they may provide additional training for the current personnel: schooling strategy (De Grip & Groot, 1990).

The banking sector is a good example of a sector in which far-reaching technological development has taken place. The introduction of mainframe computers in the sixties was an important step, allowing the automated processing of transactions in the administrative departments of central offices (central automation). Another important step was the automation of local offices with the introduction of 'on-line' back office terminals in the second half of the seventies (decentralized automation). In the eighties the process of decentralized automation took a leap forward with the introduction of 'front-office' terminals for the tellers, allowing data entries to be immediately processed by the central mainframe, using the telecommunication network. Because of the adoption of information technology, there has been a substantial rise in productivity in the banking sector. However this rise has scarcely affected employment levels. The large rise in the volume of transactions, as a result of automation, compensated for the labour-saving effects of automation (Muysken et al, 1990, pp 19-21).

Central automation has had only minor consequences for the banking sector's employment structure, but it did lead to the emergence of two new occupational groups: data typists and

automation experts. The more recent decentralized automation of the branch offices, on the other hand, has an influence on the nature of the activities in practically all functions within the banking sector (De Grip & Groot, 1990). It should be noted here that over 80% of employment in the banking sector is located in branch offices.

A MERIT/ROA survey (De Grip & Groot, 1990) has shown that there has been a shift in the occupational and educational structure of the banking sector.

Shift in occupational structure

In the period 1981 to 1987, employment of data typists, secretarial, and administrative personnel in local offices has decreased, while there was an increase in the number of client advisors, commercial personnel and desk personnel. The instalment of desk terminals meant that data entry was no longer performed by specialized data typists, but rather by desk personnel: a shift from administration in the back-office to more commercial, client-directed front-desk activities. This shift, resulting from the technical possibility of having processing capacity and databases immediately available at the front-desk, enabled the banks to delegate a large number of decisions and hence to provide services geared to the local market and the specific needs of a client.

Shift in educational structure

The changes in the occupational structure were accompanied by changes in the training structure, which has also been affected by changes in the training requirements for the various occupations. Among desk personnel, for instance, the proportion of personnel with a general education fell, while the proportion with a professional education (in commercial administration, for example) rose. This rise was partly a result of the increasing number of personnel with a basic vocational training (especially with Intermediary Business Education, MEAO), and partly as a result of an increase in the number of employees with an acknowledged professional qualification at a higher level. Most supplementary training consists of courses related to a specific business or sector. Banks with advanced automation had a larger proportion of employees with vocational training qualifications, and at a higher average level, than the less advanced banks. From this, we may conclude that office automation leads to a rise in the required training level. For desk personnel, it seems that front-office automation has increased the demands of their task, especially in relation to their knowledge of banking services. This is an indication of the close interrelation between the consequences of technological developments and organisational changes. The technologically advanced banks do not seem to give more attention to training than the less advanced banks. It is possible that these less advanced banks are trying to catch up, which would account for the fact that the intensity of training is

almost the same for both categories. It does look as if the leaders in technological development also lead in the setting of higher educational requirements for new personnel. It is considered important for new personnel to have had a basic professional training in commercial administration.

A few crucial points can be highlighted with regard to emerging requirements for new skills in the banking sector and more generally in the service sector (Janssen, Justino & Dersjant, 1990). Service work is becoming more and more customer-orientated and requires ever greater social skills. Secondly, the emerging new workplace requires workers to deal with non-routine tasks and to detect and remedy problems. Thirdly, there is an increased pressure on workers to work as part of a team and to be able to communicate and learn in the workplace, not least in relation to new technologies. This is also related to the trend towards making personnel more broadly employable in order to deploy labour as efficiently as possible. Looking at these requirements it becomes clear that one of the challenges facing education and training systems is to impart more advanced thinking skills to the great majority of those leaving education and training. The question is what implications this has for initial education. Should courses in technology be introduced in primary or general secondary education, or should pupils have lessons in open communication and/or client-orientated behaviour? Or should changes take place in initial vocational education rather than general education? The fact remains that in a centralised educational system, as is the case in the Netherlands, the response time is generally very long. The more immediate consequence is that the existing workforce has to be re-trained. The choice facing large companies is whether to design an in-company training programme or to contract out specific training activities. Small and medium size companies will in the short run only have the option of looking for a supplier of the desired training programme. In the long run they may set up a joint training centre or invite an educational institution to develop a specific programme. A training centre which has been established in Limburg will be outlined in section 3.2 of this chapter.

7.3. Office automation in Limburg

7.3.1. Computerization

In 1987 a survey on the consequences of computerization for companies and occupations was carried out among a sample of 830 companies in Limburg (Batenburg, 1989). Only companies with more than four employees were investigated. The 830 companies account for 8.9% of the 9,276 companies in Limburg with more than four employees. The survey was carried out by the 'Instituut voor Onderwijs-en Arbeidsmarktonderzoek' on request of the 'Directoraat-Generaal

van de Arbeidsvoorzieningen in de Provincie Limburg' (the provincial directorate of the public employment service). Among the themes the survey focused on were occupational change and training.

With regard to *occupational change* the following findings were made:

- computerization has not led to a distinct net employment effect within companies;
- as a result of computerization 84 new positions were created, mostly in commercial services (banking and insurance), followed by manufacturing. Other service industries created few new positions. Most new positions were created in large companies (over 200 employees). Network manager and programmer were the most often mentioned newly created positions. The average level of the 84 newly created positions was higher than that of the 40 positions which disappeared as a result of computerization. Most positions disappeared in industry;
- four out of every hundred companies in Limburg had vacancies as a result of computerization at the time of questioning (mostly in manufacturing, followed by commercial services). On average the vacancies are at the intermediary vocational level.

The following findings were made with respect to *training* in the field of computerization.

- In most companies training is arranged by the manager himself. Only the largest companies employ specialised staff responsible for training.
- Most training is provided externally (usually by the suppliers of the hardware). 35% of the companies where employees are trained provide this training internally.
- In general companies experience few problems with respect to the quantity or quality of training supply.
- As a consequence of computerization an average of six employees per company per year are trained in Limburg. This figure, compared to the total number of employees in the companies, means that one out of every seven employees receives training in a given year. This training ratio is very high in commercial services (one out of two employees), followed by industry (one out of four).

7.3.2. Two initiatives

Centre for Office Innovation (CKI)

The CKI was founded in 1984 as a non-profit foundation. The basic goal was to offer training to job-seekers who used to have an administrative function (i.e, to the unemployed and to women re-entering the workforce). In addition, the CKI would provide training for working people, including school-teachers. The establishment of the CKI was the result of a joint initiative of a number of companies in Limburg, and the local government and Bureau of Labour

in Venray.

Since it started in 1985, the CKI has progressively focused less on job-seekers and more on the training of working people. In 1985, 90% of the students were job-seekers. In 1989 this figure was only 20%. In 1990, the CKI was converted to a private company. The CKI does not offer standard courses, but rather adapts courses to the specific needs of particular organisations. It offers 12,000 'student days' per year (1,200 days of courses, with an average of 10 students per course). About 40% of those courses are on behalf of governmental or semi-governmental institutions, and the remaining 60% are for the private sector. Since one and a half years ago, the CKI has also been occupied with developing software.

There are voices in the CKI that plead for a training programme for 'office analysts'. The task of these new personnel would be the organisation of office activities, in particular of standard activities (organizing in order to computerize). He or she would therefore have to focus on the social and technical aspects of office automation (organisational and procedural consequences) in order to achieve more efficient utilisation of the available hardware and software.

Telematics

The combination of informatics and telecommunication is called telematics. Electronic Data Interchange (EDI) is an application of telematics in trade and industry, where structured messages are exchanged electronically between diverse organisations. A survey of the Maastricht Economic Research Institute on Innovation and Technology (MERIT) shows that one quarter of the users of EDI employed extra personnel to supervise the introduction of EDI. As far as extra training is concerned, two-thirds of the users have undertaken training activities to support EDI (46% in trade and 85% in manufacturing). The major part of the training activities are orientated to the operational personnel (in 43% of the businesses), followed by automation personnel (34%) and management (25%). Almost 60% of the users of EDI found that their data entry activities fell away as a result. Practically all of the users found that the personnel involved received new or partially new tasks, half of which were closely related to EDI. On balance, EDI is expected to have a neutral effect on employment. A reduction in activities connected with administrative organisation is indeed expected, but it will be balanced by an increase in information volumes (Ministerie van Sociale Zaken en Werkgelegenheid, 1990).

Transport information systems are a specialised application of telematics in the transport and distribution sector. Information systems in this field are used for reducing the circulation of text documents (e.g. SAR, SAGITTA, Cargonaut), the exchange of goods (e.g. Tradicom, Transpolis) or for piloting transport (e.g. Travelpilot, CARIN, RDS, MCSS, MTCS, VBS and Road-Pricing). In

December 1988 the city of Maastricht awarded the contract for a research project on the possibilities for specific training courses for the transport and distribution sector in the ISO-area South Limburg¹. The contract was awarded to the consulting engineering firm for telematics projects 'Intercai'. The research showed that new information technologies like EDI require the following basic skills: the ability to abstract and formalize, interactive thinking and thinking in economical terms.

The technical skills relate to:

- understanding, knowledge and use of new technologies;
- knowledge of technical operations required for processing data bases;
- evaluating new technologies in view of labour organisational conditions.

The normative skills relate to:

- social skills;
- autonomy and teamwork;
- curiosity and creativity;
- an active attitude and open-mindedness.

Skill shortages and thereby possibilities for training were found with respect to transportplanners, transportation experts, logistic managers and stock managers. It was recommended to use intermediary organisations between regular vocational education and 'on the job' training (interfaces) as a framework for the realisation of sector trainings. The regional training contract agency, which was founded in 1989 as part of the ISO-project South-Limburg, was put forward as an interface (Intercai, 1989).

7.4. Conclusion

The results of technological developments in relation to office work are characterised by diversification (within the sector, and within functions). We have seen one clear example of diversification in relation to the intermediaries between conveyor and transporters, with the disappearance of the demarcation between specialised categories of shipping agents and between shipping agents and transporters. This was made possible by the introduction of systems for Electronic Data exchange. The banking sector is an example of a sector in which the instalment of desk terminals has led to a shift from administration in the back-office to commercial, client-directed front desk activities. This resulted in a rise in the required training level of bank employees.

1. ISO stands for Intensivering Scholing door Onderwijs-instellingen (intensifying training by educational institutions). This national project aims at improving the labour market position of unemployed teachers through (re)training and at improving the educational infrastructure by matching between training courses and the labour market.

8. THE PRINTING AND GRAPHICS INDUSTRY

8.1. Introduction

Training in the graphics sector has always been organized on the principle of learning while working under the supervision of a specialist and following theoretical training in a vocational school, finishing the training with a certificate that gives access to the profession the student has been trained in. This classical vocational training method was based on a stable structure of professions, great resemblances between companies as far as techniques and organisation are concerned and the possibilities of almost casually learning while working. Since the late sixties, when the shift from typesetting in lead to photo-typesetting and from relief printing to planography took place, it has become clear that this training structure can no longer be maintained. This chapter will describe how training and labour market policies took shape up to the seventies, what technological changes have occurred in the seventies and eighties, and what consequences they have had for training and educational policies in the graphics sector. The final sections focus on current developments, and the most important organisations, in training policy. There will also be a description of some regional aspects of training policy.

8.2. Description of the sector: nationally and in Limburg

Some figures:

The printing and graphics industry in the Netherlands consists of some 2,750 companies, where 50,000 people are employed. The turnover of the total graphics industry amounted to 7.8 billion¹ guilders. The importance of the printing and graphics industry for the Dutch balance of payments is relatively limited however: in 1988 exports amounted to 1.9 billion and imports to 1.7 billion guilders. The main types of products exported were books and brochures (32%), advertising material and trade catalogues, etc. (about 24%), and newspapers and magazines (about 20%).

In Limburg the sector 'Graphics Industry and Publishing Companies' consists of offset printers, newspaper and magazine publishers, book binders and copying companies. Some 500 companies in the field employ about 4,000 people. Six big companies provide over half of the jobs available. In 1989 total sales and export sales in Limburg were stagnant.

Technological development in the printing and graphics industry is very rapid. Apart from the price, quality and delivery time are also important in remaining competitive. That accounts for the increasing level of investment in the sector (up 24% in Limburg in 1989), mainly occurring in the big graphics companies in central Limburg. Nevertheless, employment also increased

1. American billions, of 1,000 million, are used throughout.

substantially in 1989: by 5% in the whole of Limburg and by 8% in central Limburg. In the Maastricht region and its surroundings there was a slight decrease of -1%. In the near future, however, big changes may well occur. Late in 1990 the publishing company VNU announced its intention to close down all its graphics companies, because it expected big investments to be needed in the near future. Printing is also increasingly contracted out to companies abroad (especially in Ireland).

8.3. Development of the sector to about 1970

The graphics sector in the Netherlands is known for constantly good labour relations. The reasons for this calm may be found in the thoroughly institutionalized relations between employers and employees, beginning with the 1914 and 1917 Collective Labour Agreements² ('awards'). In the 1914 award, the 'constitution' of labour relations in the graphics sector, obligatory membership of employers' and employees' unions was agreed upon: the 'unorganized' are excluded as much as possible, so that the industry is a 'closed shop'. Both parties also agree to help each other observe the agreements they have made concerning wages and tariff stipulations, entry, mobility and resignation. Entry is limited: the only way to obtain trade skills and the status of tradesman is through vocational training in the workshop. The employer is forbidden to give technical graphics work to unqualified workers. Mobility is also entirely governed by the system of training and certification: promotion to a position with a higher grading and wage scale is possible only by obtaining the required certificate. The agreements for fixed manning levels, which set the numbers and type of employees required to operate certain machinery, are also internally regulated. Lay-offs always require a valid reason, and the seniority principle is applied. Vacancies and lay-offs have to be reported to and registered by the labour exchange, which also plays an important role in handling vacancies and job placement for the sector. The internal market system thus created is known as a differentiated professional market, consisting of 42 occupational groupings, divided according to parts of the production process and type of company. There are 42 separate wage scales for the occupational groups, creating a direct relationship between training, occupation and reward. From 1970 onwards there has been very rapid technological change in the industry. As a result of new machinery and opportunities for companies to organize production according to their own requirements, the functions have become far more diverse and company-specific, and many functions which fall outside the field of traditional graphics techniques have been created. This has also led to the creation of functions at a lower and middle management level, where graphics trade skills play a less important role. In these functions a knowledge of automation,

2. 1914: Eerste Grafische CAO, 'The Basic Law on Graphics Labour Relations'; 1917: Tweede Grafische CAO: 'Rules for entry (training) and exit (layoffs)'.

along with organisation and communication skills, are increasingly important.

8.4. Technical development and changes in training policy

The printing and graphics industry has always been a capital intensive sector. Labour productivity (value added in millions ÷ number of employees) was $(4,310 \div 54,175) = \text{Dfl } 79,556$ per employee. In 1987 it had risen to $(4,796 \div 56,355) = \text{Dfl } 85,103$ per employee. In the same period, the average labour costs increased from $(3,162 \text{ million} \div 54,175) = \text{Dfl } 58,366$ per employee to $(3,412 \text{ million} \div 56,355) = \text{Dfl } 60,544$ (figures: CBS, 1990).

A study by Muysken et al. (1990) shows that computers in the graphics sector are used mainly for design (CAD), planning of the flow of stock, production and materials (CAP), and control of the manufacturing process (CAM), using mainly Computer Numerical Control (CNC) machines. The printing and graphics industry initially developed strongly in CAD, but in the eighties there was stagnation in comparison to other sectors. The development of CAM usage is gradual and parallel to its introduction in other sectors.

This section describes a number of developments related to technology and training which may be summarised as follows:

1970s	Beginning of drastic technological change;
1970-1978	First restructuring of work descriptions etc. as a result of the technological changes;
1973	Foundation of the jointly controlled Graphics Training Centre (GOC);
1977	First massive strike in the sector since 1923, related to inflation-indexing;
1978	'New Themes' training policy: the result of the first restructuring;
1980	Second Restructuring: due to the dissatisfaction of the employers with the first restructuring;
1990	'Made-to-measure Training': research; marketing plan for the GOC; Labour Market Plan 1991-1992.

Three production steps were traditionally distinguished in the graphics production process:

- *preparing and making the 'matrix' ('pre-press')*: in this phase, the text is set and the illustrations are adapted to the extent that, when combined (lay-out), they form a printing matrix. Nowadays, photographic and electronic typesetting techniques are used and exposure and typography are computer-controlled. High-technology electronic methods have also been developed for reproducing pictures and arranging the matrix.
- *the printing itself*: the three most important techniques for transferring ink, via the matrix, onto the material are relief printing (letterpress printing), planography (offset printing), and engraving. Other printing methods have been derived from these techniques, such as rotary press printing and flexography, silkscreen printing (serigraphy), and steel engraving.

- *finishing*: this includes folding, cutting, compilation, and assembly. There are rotary presses which perform these functions automatically, but a lot of printing work requires still other processes, such as perforation, gluing, or binding.

In the seventies, the major changes in preparing and making the matrix have occurred as a result of changes in technique (from typesetting in lead to photo-typesetting, and from reproduction camera to scanner), and because of flexible automation. Today there is a trend towards clients performing more and more layout work, because of the introduction of desk-top publishing (DTP). In addition, less preparatory work is performed manually, so that more specific knowledge of layout equipment is required. In the printing phase, the most radical change in recent years has been the change in method, from relief printing to planography. There has also been gradual automation. Because of mechanisation and automation, many new specialisations have developed in the finishing phase, and the possibilities for product diversification have increased. In all phases, smaller businesses in particular are specialising.

Another important trend is to increase the utilization of machine capacity. This is accompanied by a desire for longer operating-hours and the introduction of shift work, which runs counter to the trend to shorter working hours.

The market has also been undergoing enormous changes, parallel to these technological developments. In the market for advertising materials, the advance in marketing and communication techniques requires a more intensive and specific approach to target groups ('target group fragmentation'), with more accent on individualisation of the advertising material and direct marketing. This has considerable consequences for the mass media in general, printed media, special-interest periodicals, sponsored PR magazines, catalogues, pamphlets, etc. Out of the total expenditure on printed matter in the Netherlands (Dfl. 6.7 billion in 1987), about 55% was for printed advertising matter. The larger part of the printed material (about 70%) consisted of newspapers and local advertising tabloids. About 17% went on general magazines, and 12% on specialized journals. As far as is known, no studies or forecasts have been made of the proportions which may be expected in the future within the printing and graphics industry, or of its importance in relation to other media.

The developments described above have led to diversification. The graphics sector used to be concerned mainly with printed material and the printing process. Now the sector has become part of the communication and information industry, and its product is thought of as the transmission of information. The distinction formerly made between the three phases of preparation, printing, and finishing now obscures rather than explains; there is actually a wide

diversity of businesses:

- copying companies (photocopying);
- word processing companies and typesetters;
- advertising agencies and design studios;
- reprographic companies;
- photographic studios;
- editorial offices;
- publishing houses;
- printers, for paper, plastic, and other materials;
- in-house printers;
- packaging printers;
- binderies;
- printers of stationary and other office requisites.

The technological developments have had several consequences for the printing and graphics industry:

1. The technological heterogeneity of the sector has greatly increased, resulting in divergent requirements in training and qualifications.
2. There is increasing tension between the companies, which are often still organized along traditional lines, and the practical part of the new training requirements. To comply with these requirements, rotation among various functions, and sometimes even between departments or businesses, is necessary. However, for many companies, rotating employees among various functions is still a problem.
3. Constant changes are taking place in the production process as a result of the great steps taken in technological development. This means that not only companies but also training institutes in the sector have problems with meeting the expected demand for retraining and supplementary training.
4. Changes in production techniques also lead to changes in the organisation of production. This company-specific organisation of production leads to a greater diversity of functions and of qualification requirements.

The first stages in this development led the unions to demand, in 1969, that new functions be included in the award. In 1970 the employers' organisations asked for a total restructuring of the complex wage structure. The Commission for Function Restructuring, created for the purpose, made a proposal in 1975 for six wage groups and 40 defined functions. Negotiations about the new training structure continued until 1978, when it was established under the name of 'New Themes'. It consists of a basic training of two years, to the qualification of 'graphics

tradesman' in one of the three areas which are distinguished in the graphics production process: reproduction and matrix production, printing, and binding and finishing. An obligatory further training leads up to the level of 'graphics technician', qualified to practice the trade independently.

Soon after the introduction of this new training structure there were complaints, especially from employers, about the large organisational problems that the practical part of this training caused the companies and the weak practical orientation in the training itself, which forced companies to provide additional training. At the same time, the employers voiced their wish to give the graphics labour market a more open and flexible structure, with more possibilities for overtime and outwork, calling in temporary workers and restructuring the wage system. As regards the training, the employers preferred a simpler, more company-orientated training and a more diverse and flexible training structure. They would also like a broader admittance policy for retraining and further training, which had been available only to employees with a trade certificate. During the award negotiations in the early eighties a new training plan was developed, mainly in response to the demands of the employers. The qualification of graphics technician is no longer the predetermined level which every student has to reach. The graphics employee can decide the level to which he wishes to be trained. In addition, training for a completely new occupational level was introduced: the 'graphics assistant' for new, simple support functions. A new level and a new training, as 'process manager', above the level of graphics technician, was also added. The process manager may supervise a workshop and the training of a number of apprentices. In addition to this differentiation of four levels of training and responsibility, the flexibility of the training system was increased by dividing the courses into modules. By combining several different types of module (orientation, basics, and trade specialisation) the basic training can be specialized and orientated to the company.

8.5. Relevant organisations in the sector

The following organisations are important in making and carrying out policy in relation to the awards, labour market, and training in the graphics sector:

- The 'Graphics Union CNV' (National Christian Union) and the 'Print and Paper FNV' (Dutch Federation of Unions), with 7,300 and 48,000 members respectively, are the most important employees' organisations in the sector. Since the total number of employees is around 50,000 this is a participation rate due to obligatory membership of almost 100% (allowing for double-memberships, and the unions' coverage of some non-graphics workers).
- The Royal Union of Graphics Companies (KVGO) is the main employers' association with around 3,000 members and a participation rate of 90%. The national KVGO office has about

100 employees, 6 of whom are field workers. They maintain contacts with, and give advice to, members in the KVGO's 25 regions. Limburg has two such regions.

- Employers' and employees' organisations together control the Central Bureau for Graphics Companies. This bureau provides administrative and strategic support to the various commissions that deal with aspects of common importance, such as schooling, employment, etc.
- The Graphics Training Centre (GOC) was founded in 1973 as a joint coordinating organisation for the training institutions of the printing and graphics industry. The GOC develops and coordinates all training other than full-time complete courses. Thus it covers apprenticeship, retraining, further training and supplementary training courses and in-company training. To this end, the GOC has an extensive infrastructure at its disposal: the main office in Amsterdam with about 55 employees, a national training centre in Veenendaal with 30 employees, a network of 25 consultants who maintain daily contact with the main office and the companies, training institutes, and (potential) students in their region. One development relevant to this study is the GOC's intended shift of accent from training centre to innovation centre: this means that training activities would more and more be left to graphics institutes. The GOC would then have to pursue a policy of making innovations and managing technology, rather than its current 'technology-led' policy. In this vision the GOC-consultants would also have to operate as advisors for training and personnel planning (GN, nr. 30. 1990). The GOC sees a role for itself in the development of training schemes for graphics companies (GOC, 1990).
- The BWGI: the printing and graphics industry Employment Bureau is a joint organisation, housed at the GOC. Originally, in 1976, it had the task of guiding employees who lost their jobs because of changes in the company's production machinery. The main tasks are now: providing information about vacancies, gathering and giving out information to companies about personnel supply, supporting the recruitment of apprentices, and collecting supply and demand data relevant to employment and labour market policies.
- The Graphics Economic Advice Centre (GEA) conducts research and advises employer and employee organisations in the sector.
- The printing and graphics industry Funds (GBF), which includes the General Social Fund for Graphics Companies (ASF), charged with holding training levies, and financing training activities in the sector. The training fund is about 0.2% of the total bruto wage amount. The so-called equalization fund was in 1989 and 1990 about 0.6% of the total bruto wage amount.

8.6. The training infrastructure in the printing and graphics industry

1. In the Netherlands, normal or evening-class 'regular' graphics training (i.e, full-time complete courses, given in an institution) can be taken at a Lower Vocational level (LBO), an Intermedi-

ary Vocational level (MBO) and at a Higher Vocational level (HBO). There are 18 LBO schools where a four-year basic training in graphics is given, after which it is possible to continue the training via the apprenticeship system, described in the following paragraph, or at one of the 5 short MBO or 3 regular MBO training courses. In Tilburg (not Limburg, but still in the south of the Netherlands) a course in graphics management at an HBO-level may be followed. Students in Limburg who wish to take a graphics training at MBO level have to go to Eindhoven. The Lower Technical Graphics Training is only given in Roermond.

2. Youths between 16 and 27 years of age can take part in the apprenticeship system: this is a government-subsidized vocational training based on a training agreement between the student and the company. In the printing and graphics industry this training is being coordinated by the Graphics Training Centre (GOC), which has already been mentioned. The students work four days a week in a graphics company and attend courses one day a week for trade-orientated (theoretical) education. The 25 GOC consultants in the country supervise the progress of the students.

The GOC has four training levels:

1. 'Basic' training, for graphics assistant;
2. 'Primary' training, to the level of graphics technician;
3. 'Advanced' training, training for independent technician;
4. 'Tertiary' training, training for process manager.

Training at the first three levels is given within the framework of apprenticeship. At all three training levels, a choice must be made between three main areas of study: preparation, printing and finishing. The primary and advanced training then give the choice of 48 and 26 professions respectively. The two tertiary training courses (as Graphics Technical Practice Trainer and as Graphics Technical Foreman) may be taken at one of the five graphics institutions ('lycea') in the country. The Eindhoven Graphics School is the closest possibility for students from Limburg.

In the period 1987 to 1989, 74% of the graphics companies have taken advantage of the apprenticeship scheme. In 1989 there were a total of about 136,000 training contracts between student/employees and businesses, in all sectors. Almost 20,000 of these contracts came from the printing and graphics industry. In 1988 3,830 new training contracts were made in the Dutch graphics industry; in 1989 there were 4,282, an increase of 11,8%. Of these, only 138 (or 3.2%) were in Limburg.

3. Apart from apprenticeship training, the GOC training centre also provides graphics courses and training programmes for which a need has risen in the graphics sector. These may

concern retraining or further training courses as well as (written) courses for the technical personnel of graphics companies. Apart from the regular courses, seminars, introductory courses and incidental courses are also given. For those companies where a larger number of employees have to have retraining or further training, there is the possibility of starting company projects. Training then occurs in the individual company, or in the company as well as the training centre. In the period of 1987 to 1989, 38% of graphics companies made use of one or more of the 'Veenendaal-courses' of the GOC, 19% used a written course from the GOC, and 6% used a GOC company project.

4. Apart from the training offered by 'regular' training institutions and joint organisations, the employers' organisation KVGGO has established the KVGGO Foundation for Vocational Training (STIVAGO), which provides courses in management for KVGGO members.
5. Besides the training possibilities mentioned above, a number of provincially financed training projects have been started in Limburg, meant for the 'hard-to-place unemployed'. A couple of these projects are aimed at the graphics sector³:
 - In 1987, the 'People without jobs' foundation in Venlo initiated a training project for longterm unemployed, school drop-outs, women, and women reentering the workforce. Of the 89 participants, 22 were engaged in an individual 'path of training' for the printing business.
 - Since 1987, the Limburg Federation for Social Employment has led a total of 122 unemployed handicapped people through a vocational training with an apprenticeship structure. Training in graphics techniques was one option. This project is running well, partly due to the very good participation of companies.
 - In the framework of the European Social Fund programme for the Limburg Mining Area, the province has given a contribution to the 'New Media' course given first at the Heerlen Creativity Centre, now transferred as a 'regular' course in a technical institute in Maastricht. This project was initiated in 1987 for a duration of three years and aims at the retraining of unemployed persons with a higher vocational education (HBO level) as practical multimedia specialists. The training comprises courses in video graphics, telematics, computer graphics, audio-visual course material, and interactive video. Up till now, 46 people have completed the course.
 - PBVE-projects (projects of Basic Vocational Training for Adults). The Venlo PVBE-project in particular offers many graphics courses. The Graphics Training Centre GOC is very much involved in the graphics projects. The Roermond PVBE offers a restricted number of

3. Data derived from the Provincial Labour Market Program Evaluation (Provincial Arbeidsmarktprogramma Evaluatie 1987-1990).

graphics courses and Maastricht and Heerlen are not as yet active in this field.

- The Centre for Vocational Orientation and Training (CBB) in Heerlen, gives 15 to 20 young people a basic vocational training aimed at the printing and graphics industry, as a part of 'street-corner work' (social work for homeless youths).

However, various specialized discussion partners of the sector have their doubts about these training projects and had some less than positive experiences with the quality of the training and with the participants' motivation to work and their ability to cope with work pressures.

8.7. Labour market problems

As yet nothing can be said about the number of difficult-to-fill vacancies in the printing and graphics industry, since the Central Bureau of Statistics provides no figures. A survey by the printing and graphics industry Employment Bureau (BWGI), which records the monthly personnel turnover in the sector, shows that the demand for professional personnel is constantly greater than the supply: this difference was at a minimum (237) in November 1989 and a maximum in June 1990 (440). The movements of demand and supply appear to be antithetical and seasonal. This is contrary to what would be expected: the peak in the demand for, and the lowest point in the supply of, professional personnel appear to be in the summer months. A possible explanation for this phenomenon is that many job changes occur in the busy winter months. For the background to the recording and functioning of supply and demand in the graphics market, see section 3 above.

In the BWGI's 'Labour Market Plan 1991-1993', which relates to the new award period, the following problems are anticipated in the coming years:

1. a shortage of technically trained personnel (especially colour technicians, scanner operators, offset printers and final processors) because of a growing demand for replacements (5% of current staff, or 1,750) and a rather lower demand due to expansion (1%, or 350). Remedy: various actions to increase the entry of new personnel;
2. a shift from manual to automatic skills because of growing automation/computerization, especially in pre-press functions. Remedy: various actions to increase the transfer of pre-press personnel to other functions;
3. the unfamiliarity of the public with the graphics sector;
4. insufficient differentiation in the training on offer;
5. a shortage of information about developments on the labour market;
6. regionalization of labour supply management (see chapter 3, section 3, 'employment policy').

The accuracy and reliability of expectations concerning these problem areas are very much dependent on the extent and quality of the basic information. The predictions above are based on seven sources:

- empirical research (prognoses and recommendations taken from the studies 'Composition of occupations and training needs in the printing and graphics industry' for the years 1989 and 1990; the industry survey of 1989 for the printing and graphics industry; and the GOC study (1989) of the participation of graphics companies in training programmes);
- records of demand and supply of tradesmen, and of the numbers participating in GOC-training;
- the evaluation of the labour market plan 1989/1990, complemented by the apprenticeship policy for the printing and graphics industry.

With an eye to the mentioned qualitative and quantitative problems, the following policy objectives and measures have been included in the action plan for 1991-1993:

1. To increase the entry of school graduates, special target groups and other trained people, and to increase the training capacity of companies, the intention is to initiate mailing and publicity campaigns and to approach individual companies with a concrete training plan.
2. To assist the transfer of personnel to new functions and from auxiliary functions to technical and administrative roles, it is intended to develop a new training supply, accompanied by information and test projects.
3. To increase the familiarity of careers advisors, student counsellors and Bureaus of Labour with the printing and graphics industry, a publicity plan and network will be established.
4. Diversity in the training offered ('made-to-measure training') must be achieved by conducting and more frequent research, some of it on a regional basis, into training needs, and by updating time and organisational aspects of training and increasing flexibility.
5. The BWGI wants to obtain a better insight into possible future imbalances in the graphics labour market, resulting especially from external developments, by working more with (or investigating the possibility of) flexible scenarios rather than static predictions.
6. In view of the decentralization and reorganisation of labour supply management, a reorientation of the graphics sector is desirable. The regional division of graphics training institutes and the employers' organisations and unions, for instance, does not match with the new Regional Boards for Employment Policy (see chapter 3).

8.8. Strategies

In the course of its 'made to measure training' project, the Graphics Training Centre conducted substantial research in 1990 into the participation in and evaluation of its training activities among graphics companies. The following facts emerged:

- 35% of graphics companies do no training. Almost 90% of these companies employ less than 11 people. The reasons given for not giving training, were the limited size of the companies and their unfamiliarity with the training possibilities and subsidies.
- 65% of graphics companies do give training. These companies together employ over 80% of the total technical personnel in the printing and graphics industry. The focus of attention is still on the initial vocational training of new personnel (80%). The training of current personnel is intended mainly to obtain more specialized or more versatile employees.

The results of this extensive market study have been gathered into an up to date company-by-company marketing information system and form the basis of the Memorandum 'Made to measure Training'. In this memorandum a number of recommendations for Graphics Training Centre consultants are formulated, concerning approaches to companies that do and do not (yet) train. The most important conclusion seems to be that there is sufficient familiarity with, and activities for, the initial training of new employees. It appears, however that more attention should be paid to retraining and further training courses (including shorter courses) for current personnel.

According to some conversations with specialists in the South Limburg graphics industry, it appears to be difficult to find trained and experienced people for a number of occupations. The demand for (experienced) printing technicians, in particular, greatly exceeds the supply (in Limburg the rate was 11:1 on 30.11.90. Source: BWGI). There are several reasons:

- the attraction of the nearby foreign countries. The vocational training there is at a significantly lower level, so that personnel are 'bought away' from Limburg;
- the relatively strong growth of the sector in this region, over a short time. This is especially because a number of foreign companies were established here;
- the absence of lower and intermediary graphics training in the region. School students in the region are relatively unfamiliar with the possibility of a training and career in graphics;
- It has been pointed out before that the number of learning contracts concluded in the graphics sector (138) is very low from a national point of view.

8.9. Summary and conclusions

The printing and graphics industry has long been a clearly defined, solidly organized sector, in which employers as well as employees formed and executed the training and labour market policies in consultation and with coordination. This was done in the framework of the labour market system for the trade, the fixed labour conditions and other 'closed shop' rules (relating to entry, circulation and exit). Due to the changes in production as a result of technological

developments (especially in the pre-press and printing phases) and the disappearance of old functions and the development of new functions, the labour market system for the trade could no longer be maintained.

Even though the unions were at first reluctant to change this labour market structure, after years of preparation and negotiation they finally agreed to a restructuring of this system. Linking up with six new wage groups and forty different functions, this 'New Themes' structure provides two training levels. The employers, however, wanted a rapid and on-going diversification in, and increase in the flexibility of, functions and function levels, and less rigidity in the 'closed shop' rules, which had already become more open due to the increasing vagueness of sector boundaries. These demands were largely complied with during the second restructuring in the early eighties. Nevertheless, the printing and graphics industry is still a very transparent and structured market. The sector is very well informed and documented, and has a great degree of openness and accessibility, supported by all of the organisations involved.

9. METAL INDUSTRY

9.1. Introduction

This chapter describes the labour market and training policies in the Dutch metallurgic sector, on the basis of previous research and the policy documents of organisations in the sector. After a general description of the importance of the sector for the Netherlands and for Limburg in particular (Section 2), some relevant background developments, in the seventies and eighties, are outlined in section 3. Section 4 examines a number of technological developments and their effects on training requirements. Section 5 describes problems and corresponding strategies. Section 6 introduces some of the organisations that are involved in the labour market and training policy in the metallurgic sector. The training infrastructure and training projects in Limburg are discussed in section 7.

One important distinction made in the metallurgical sector, is that between metal-working concerns (light engineering: less than 30 employees) and the metallurgical and electrical industry (steel industry: more than 30 employees). This distinction is also visible in the employers' organisations, the awards, the educational and training funds and policies on the subsidizing of training projects. The same distinction has been used in some of the research reports which will be cited, especially in the OSAM-researchproject, which focussed on light metal-working.

9.2. Description of the sector

The heavy metallurgical industry in the Netherlands consists of seven sectors: the base metals industry (70 companies), the metal products industry (4,000 companies), the machine industry (2,300 companies), the electrotechnical industry (800 companies), the transport industries and the optical and instruments industry with around 600 companies together. In 1980 the labour volume in the heavy industry was around 410,000 labour years; in 1988 it had gone down to around 370,000. The number of vacancies fell from 8,100 to 6,800 over the same period, while the number of hard-to-fill vacancies fell from 5,600 to 2,500 (CBS, 1990). In 1989 there were about 50,400 unemployed from the sector (0.74% of the total working population) (SOZawe, 1990).

The metallurgical sector is relatively sensitive to economic fluctuations. Although the Central Bureau for Planning had positive expectations for the metallurgical sector as a result of European integration, the current war in the Gulf could cause a recession. A number of factors

limit the supply of personnel to the metallurgical sector, such as its negative image as a result of uncongenial working conditions a relatively high number of industrial accidents and a high rate of absenteeism, the falling proportion of school-leavers with a technical preparatory training, the relatively high number of personnel leaving the sector, and the low proportion of women in the sector.

Metallurgical industry provides about half of the total industrial employment in Limburg. Within the sector, the metal products, machinery, and transport and motor industries are most important. Together they account for 80% of employment in the sector. The total metallurgical sector in Limburg contains over 1,400 companies where almost 44,000 people are employed. Larger companies provide 80% of the employment in the sector. In 1989 there was a slight decrease in investments in the Limburg metallurgical industry as compared to the previous year, especially in Maastricht and its surroundings (-53%). Employment in smaller companies increased considerably in 1989 (+7%). In total, there was an average increase of employment of 5%. The metallurgical and chemical industries were the fastest growing sector in Limburg in 1989.

9.3. Developments in the sector in the seventies and eighties

In the seventies, because of growing competition from low-wages countries and the worldwide recession, many companies in the metallurgical and electrotechnical industry were forced to reorganize, with large-scale redundancies. A large number of company schools were closed, partly on economy grounds, and partly due to the idea then current about the responsibility of government for education. In the early eighties big changes in qualification requirements as a result of economic and technological developments and the associated increase in flexibility of the production process, were clearly noticeable. In the eighties, the metallurgical industry was one of the sectors with the highest percentage of hard-to-fill vacancies, while long-term unemployment in this sector was among the highest in the Netherlands.

9.4. Technological development and consequences for the qualification requirements

The integration of new technology in heavy and light metallurgical industries concerns especially CAD, CAP and CAM systems: Computer Aided Design (CAD), Computer Aided Planning (CAP) and Computer Aided Manufacturing (CAM, with applications such as Computer-Integrated Numerical Control (CNC), Direct Numerical Control (DNC) and robots).

The introduction of new production techniques leads to new function and qualification

structures, resulting in differentiation as well as integration. There also seems to be a trend to replace workers with lower educational qualifications with more highly educated workers. The degree and form in which educational discrepancies (imbalances between the supply and the demand of qualifications and skills) occur, is related to the type of company and the training policy followed.

In the TOWES-project (Alders, 1988) the qualitative job structure of production processes with 'conventional technology' were compared to those of processes with 'programmable automation'. On the basis of a substantial survey, the researchers conclude that new function and qualification structures emerge as a result not only of the production technology that is introduced, but also as a result of the methods of labour organisation and other company characteristics, and the nature of trade training and recruitment. In this connection, the researchers note the beginning of a displacement process, with employees trained at a Lower Technical School (LTS) being displaced by those from an Intermediary Technical School (MTS). This trend also shows up in a recent research among almost 700 companies by the FME, the employer's union for the metallurgical industry the accent in personnel recruitment has shifted in recent years from experience requirements to training requirements. And training requirements have gone up for over half of the companies: from LTS to MTS level, and from LTS level to LTS with an apprenticeship certificate, and also by setting additional requirements for those with the previously accepted preparatory training. Moreover, 75% of the companies indicated that new production workers would, apart from a training period, have to take additional training courses because of shortcomings in knowledge and skills, the company's career path structure and personnel policy, or company-specific requirements.

A similar conclusion may be drawn from a study conducted by the Venlo Contact Centre for Education and Labour (Coenegracht, 1988) which investigated the consequences for the labour market of the introduction of production automation in the Limburg metallurgical and electro-technical industry. Computer Numerical Control, industrial robots, Computer Aided Design and Computer Aided Manufacturing were among the types of production automation that were studied. Automation of production, work preparation, and the technical side of management seemed to have been introduced to a high degree in almost all companies. The tasks of the conventional machine operator, in particular, have changed as a result. Instead of operating tasks, the focus is now on the programming and operating of CNC machines and on process control. The companies surveyed now prefer LTS and MTS trained employees with some years of experience. However, 40% of the companies have problems in the recruitment of qualified tradesmen for the function of CNC machinist and CNC machinist/programmer.

Automation of production⁴

There is a general tendency that automation of production results in the demand for higher educational levels. A shift from junior to senior vocational training and - to a lesser degree - from senior vocational training to vocational college training can be observed. Senior vocational level functions will increase and junior level functions will decrease.

Skill shortages, both quantitative and qualitative, in manufacture of metal products and in electrotechnical industry in Limburg as a result of production automation apply in particular to personnel working directly with computer controlled machines. Major problems are:

- insufficient professional knowledge and skills in the field of metal removing techniques;
- insufficient knowledge of computer programming;
- insufficient knowledge of techniques of measurement, exact sciences, technical english and plan reading;
- insufficient sense of responsibility and consciousness of quality.

For the functions of cnc (computer numerical control) metal remover and cnc metal remover/programmer there is a shortage of qualified skilled workers. The same applies to precision engineers, tool makers and quality controllers. Conventional qualified workers in the field of metal removing - both on the junior and senior vocational level - are hard to find.

A short term solution for qualitative shortages is training the existing work force and for quantitative shortages retraining of unemployed. A long term approach to qualitative shortages consists of ameliorating the initial education. For dealing with quantitative shortages in the long run, ameliorating training and vocational guidance is needed.

New materials

Industry is increasingly confronted with developments in the fields of new materials (e.g. composites, synthetics and ceramics). Until recent in particular the higher educated employees within industry have been confronted with these developments. At present also senior vocational trained employees are becoming involved with new materials. The school for senior vocational technical training and the laboratory school in Sittard, in co-operation with some companies and intermediary organisations, have introduced a part-time senior vocational training course designed to provide qualified workers and job-seekers with knowledge of new materials. It was agreed upon that on the senior vocational level also a full-time material-technology training is needed. The ETIL was asked to carry out a survey on the need for

4. Economisch Technologisch Instituut Limburg (1989).

schoolleavers of such full-time training⁵. It was found that the labour market in Limburg (in particular the chemical industry and the manufacturing of metal products, machines and transport equipment) needs 50 to 80 schoolleavers of a full-time senior vocational training in the field of material technology every year. The demand for schoolleavers material technology implies for 50 - 60% a shift in the demand. They are recruited in stead of other senior vocational trained. A material technology training does not intend to train for a new kind of fonction but can lead to a better fit with the needs of industry in existing fonctions.

The replacement of less educated workers by the better educated will not necessarily continue. Muysken et al. (1990) concluded that companies in the process of introducing a new technology are inclined to recruit more highly trained workers (MTS level) for the new production functions. When a new production method has been in use for a while, the educational requirements go down again. There may difficulties in the recruitment of MTS-trained workers for production functions, because these functions do not form part of the image or career-path of MTS-trained personnel.

Technological and organisation changes also lead to an integration of the required professional qualifications, at least for more highly trained personnel. In a study among 1,000 Higher Technical School engineers (mechanical and electrotechnical engineers), Hövels (1988) concluded that qualification requirements are becoming broader, with more focus on related fields of study, while continuing with the standard disciplines. For this category of workers there appeared to be no substitution or replacement by differently trained personnel.

Qualification problems, management and training strategies

The training and development fund for metallurgics and installation techniques, with joint financing by the government, have commissioned an extensive study of the current and anticipated bottlenecks in the internal and external labour markets they are concerned with. This so-called OSAM-research-project (Education, Training and Labour Market in the metalworking industry). One of its ten sections deals with the adjustment problems (misalignment of training and labour markets) in the metal-working industry. On the basis of survey data from 680 companies (varying in size, type of production process, innovative ability, degree of automation, development of turnover and personnel, and participation in training activities) the researchers distinguish three clusters of companies. In the first place, the 'modern company': large, innovative, and with considerable interest in the training of employees. The second type is the 'traditional/non-initiating company': of average size, with relatively little attention for

5. Economisch Technologisch Instituut Limburg (1989).

product innovation and new technology. Education and training play a subordinate role for the majority of these companies. In a few, however, there is a great deal of attention given to training activities: these are 'traditional but training orientated'. The third type is that of the 'laggard companies': mostly small companies and one-man businesses with a limited range of goods and services. Training does not play any role in these companies.

The training and experience shortages observed among current personnel apply especially to the type of company that is characterized as 'modern' and relate in particular to the level of all-round tradesmen and tradesmen in training. In the more 'traditional' type of company, there are relatively more older employees, with little or no educational qualifications and, according to the researchers, a surplus of experience and a shortage in training.

Apart from this, training shortcomings show up in the form of hard-to-fill vacancies. One finding which was very interesting, in the light of what has been said above, was that many of these vacancies were to be found in those companies that are not, or only slightly, training-orientated. The 'traditional training-orientated companies' have fewer visible shortfalls because their recruitment strategies are less dependent on the supply on the external labour market. The 'modern' company is the one with the biggest recruitment problems, especially concerning welders, sheet metal workers, and fitters and turners at the level of all-round and specialized tradesmen. The research also shows that employees in 'modern' companies think they are working under or above their training level more often than employees in traditional companies. They also consider changing jobs more often than employees of training-orientated but traditional companies.

One very interesting part of the research project was the quantitative and qualitative comparison of the labour offered on the labour market with the available vacancies and the qualifications demanded. The qualifications of the unemployed are particularly inadequate as regards their level of training. Their working experience (in years) and the level of earlier work activities fall below the employers qualification requirements to a lesser extent. Over half of the unemployed participating in the research thought they were suitable for one of the so-called problem functions and were also willing to apply for the positions. A majority of the unemployed participating were also prepared to take part in additional training courses etc. This group does however attach great importance to a job guarantee after completing the training project: for 60% their willingness to take part in training is dependent on this guarantee.

9.5. Bottlenecks and strategies

The FME survey mentioned above shows that 70% of the companies interviewed have unfilled vacancies, 60% of which, according to the employers, may be considered hard-to-fill. This appears to be the case especially in the 'Randstad' and it concerns especially tradesmen, such as qualified welders, CNC fitters and turners, etc. Moreover, 60% of the employers in the metallurgic sector anticipate a growth, in the short term, in the number of employees. Once more this relates especially to tradesmen.

Over 75% of the companies see a possible solution in increasing the possibilities for women in production functions. Other possibilities are combating absenteeism (now at 9%) and giving more attention to recruitment from groups in which the supply is increasing, such as young people from immigrant backgrounds. In the meantime the sector has also initiated a large-scale information campaign and employs sector advisors to interest school-going youth in training and a career in the metallurgic industry.

Another important cause of the personnel shortage in this sector appears to be the fact that the demand for metallurgic and electricity workers outside the sector has considerably increased. Approximately half of the total number of tradesmen with a training in metallurgy are working in other sectors (Hövels, 1989 and Bartels, 1990). To maintain a competitive position in relation to other sectors, the metallurgical sector will have to improve its image and working conditions.

The study "From underprivileged to opportunity" was conducted as part of the OSAM project. The question in this research was how to improve the recruitment of the long-term unemployed (more than 2 years) into the metallurgic sector by training. On the basis of this research it became clear that entry or re-entry possibilities can only be increased if everyone involved is prepared to make an extra effort. The policy recommendations have been worked out in a 'step by step plan', including recommendations in the areas of information supply, coordination, labour-pools, training and motivation, employment agency work and follow-up, and process and product evaluation.

Mobility promotion

One part of the OSAM project concerned a study of job mobility at sector, company, and individual levels. Employers, employees, and ex-employees from the metallurgic and utilities⁶ sectors were interviewed. Both sectors have a relatively low intake of personnel and low

6. I.e, plumbers, electricians, air-conditioning tradesmen, etc.

turnover, perhaps due to the nature of the sector, with many small and middle-sized companies. In companies that give a lot of attention to training, there seems to be more mobility and promotion. The researchers propose that career path possibilities should be more varied and mobility within the sector should be stimulated.

9.6. Relevant organisations in the sector

The association for the metallurgic and electro-technical industry (F.M.E) is the biggest employers' union in the metallurgic and electric sector (ie heavy industry). The labour market and labour relations department of the FME regularly conducts research (trends research etc.) into training needs in the sector. In this research a distinction is made between the different regions. These studies form the basis of new training material and the development of policy. The FME supplies regional handbooks on the supply of training by contract (contractual training schemes) from regular technical training institutes.

The FME, together with four labour unions, participates in the Metallurgic Industry Negotiations Board (ROM) and in the Foundation for Training and Development of the Metallurgic and Electro-technic Industry (both relating to heavy industry). This foundation is concerned with the implementation of award stipulations on training and education, which have been agreed upon within the ROM. The employers (in heavy industry) are committed, under the award, to make over an agreed percentage⁷ of their total wage bill to a special development fund. In 1990 this fund contained about Dfl. 70 million in cash, so that no levy was agreed on for that year. Training projects are partially or totally financed from this fund. These projects may relate to a special target group, for instance local unemployed youth, or may be orientated around an entire company as a contribution to the company training plan. In that case the company will receive a maximum of 25% of the wage costs of training (25% of the levy, paid to the training-fund) back.

The Foundation for Metallurgic Training (SOM) is the most important national training organisation in the metallurgics sector. The SOM is an independent organisation, which focusses especially on training for the primary and secondary apprenticeship system. Other activities are related to the training of adults (business training and supplementary training for employers). The SOM wants to focus more on education and training given by private institutions ('contract education'). At a national level, the SOM explores the need for training and for apprenticeship programmes. The SOM provides nationally recognized qualifications and certificates. It also has

7. In 1990, 0.8%.

a function in guiding training. Throughout the country it has around 80 training experts, who advise company instructors. The SOM offers training in 128 occupations in the metallurgic sector. There are about 11,000 trainees per year, in 3,100 companies. Participation in the apprenticeship system has doubled over recent years. Initially this increase related especially to the primary apprenticeship system, though it now seems that participation in further training, in particular, is growing. One focus of attention in the apprenticeship system is the success rate of the training. At a primary level this rate is 40%, at the end of the nominal term of the course. With the division into modules, and more intensive teaching, it is hoped to improve this rate in the future. (Hövels, from: Terwisga, 1990).

9.7. Training possibilities in the metallurgic and electricity sector in Limburg

1. 'Regular' training

Limburg has two higher technical schools, one in South Limburg (Heerlen) and the other in Central Limburg (Venlo). The only relevant course for the metallurgic sector is mechanical engineering. The course can be taken at both schools. Limburg has 5 schools for intermediary technical education (MTO). All 5 offer technical and engineering courses. There are 18 schools for lower technical education (LTO), offering courses in metalwork and mechanical and precision engineering.

2. The apprenticeship system

The SOM was described in the previous section. In 1989, 11,217 apprenticeship agreements in the nationwide metallurgic sector were made through the SOM. 1,227 (about 11%) of these were made in Limburg, which is a relatively large proportion.

Apart from the SOM there are some related training systems which may also be important for the metallurgic and electro-technical sector. These are the Foundation for Installation Technics (SOI), with 465 apprenticeship agreements in Limburg in 1989 (6.3% of the 7,349 agreements nationally), the Foundation for Vocation Training of Mechanics, with 815 apprenticeship agreements (6.3% of the 12,981 agreements nationally), and the Association for Electrotechnical Vocational Education (VEV) with 733 apprenticeship agreements in Limburg in 1989 (6.5% of the 11,231 agreements nationally).

3. Company training

A number of middle-sized and large businesses in Limburg have set up some company schools and training projects together. The management is in the hands of the Limburg Centre for Company Training (LCB) (see Chapter 3, section 4). The Industrial School in Weert was

established for the training of welders and work-bench workers. The Precision Plating Project trains workers for the plating industry. The Industrial School and the Precision Mechanics Centre of the LCB have departments for welding, spraying and fitting. The LCB has also taken over the project management of the North Limburg Foundary Foundation.

4. Training projects

The evaluation of the Labour Market Programme 1987 - 1990 for the Province of Limburg shows that relatively few training projects for the metallurgic and electro-technical industry have received a financial contribution from the Province: only two training projects for the automobile industry and two projects for metallurgical training for unemployed women. The last two projects were only moderately successful (despite a job guarantee) because of the difficulty of finding female participants and the high turnover during the projects.

The Sittard Labour Bureau conducts and finances (together with the ROM) two training projects for 150 long-term unemployed in the age group 18 to 35: one short course for LTS-trained students and one three year course for MTS-trained students. The Labour Bureau guarantees a job on the completion of the courses.

9.8. Summary and conclusions

In general the metallurgical sector makes a distinction between the metallurgical and electrical industry (more than 30 employees) and metal-working concerns (less than 30 employees). The technological developments in the metallurgic sector relate especially to the automation and computerisation of the preparation, execution and finishing off phases of the production process. Some large scale investigations showed that the new production technology is not the only factor that leads to changes in function and qualification structures. The characteristics of the company structure and of its labour organisation, the nature of the vocational training that is offered, and of internal mobility and recruitment, also play an important role. Company characteristics such as the size of the company, type of production process, innovative ability, and degree of participation in training activities are important variables which may explain the existence or absence of market imbalances (e.g., differences between training and work experience sought by employers and that offered by job-seekers).

The metallurgic sector is struggling with mainly quantitative problems at the moment. A recent study by the employer's union for the metallurgic industry (FME, 1989) shows that 70% of the companies surveyed had vacancies, of which, according to the employers, 60% could be

considered hard to fill. This appears to be the case especially in the Randstad (the urban conglomerate in the west of Holland) and relates especially to skilled workers such as qualified welders and CNC fitters and turners. Moreover, more than 60% of the employers expect a growth in the number of employees in the short term, again relating especially to skilled workers.

Some causes can be given for these quantitative problems:

- 1) the sensitivity of the metallurgic sector to economic fluctuations;
- 2) the working conditions;
- 3) the relatively high exit rate from this sector;
- 4) the low value assigned by employees to their chosen occupation;
- 5) the primary and secondary terms of employment, (i.e., wages, and other incentives and conditions)
- 6) society's undervaluation of craftsmanship in metal.

Over 70% of the companies considered increasing the opportunities for women in production functions as a possible solution. Other possibilities are reductions in absenteeism, now almost 9%, and giving more attention to the recruitment of groups whose numbers are increasing, such as young people from immigrant backgrounds. The sector has also initiated a large-scale information campaign and employs sector advisors to interest school-going youth in training and a career in the metallurgic industry. To maintain a competitive position with other sectors, the metallurgic sector will have to improve its image and working conditions.

10. MEDICAL TECHNOLOGY IN THE HEALTH CARE SECTOR: ANAESTHESIA

10.1. Introduction

In the early eighties the report of the Wagner Commission on technology policy in the Netherlands was published. The commission considered medical technology to be one of fourteen focal points for the Dutch technology policy. As a result the Central Government initiated the 'Programme for the Stimulation of Medical Technology'. In this programme, much attention was given to the interaction between researchers, producers and users, in relation to the development and introduction of new technology. On the basis of a description of developments in the field of anaesthesiology arising from medical technology and the development of some occupations related to anaesthesia, this chapter seeks to make it clear that the introduction of new techniques leads not only to different task contents but also to a different division of tasks. This can lead to tension if the redefinition of the existing areas of competency lags behind. There will also be a short description of how, through education and training, an effort has been made to bring about the necessary shifts in the qualification structure. The chapter ends with a short evaluation and some conclusions.

10.2. Medical Technology

Medical technology is a very broad concept, varying from knowledge of hypodermic needles and sutures to heart-lung machines and Computerised Tomography scanners. The World Health Organisation (WHO) describes medical technology as "medicine, apparatus and procedures applied in health care and the organisational and supporting systems within which care is provided". We will limit this study to intra-mural health care and in particular to academic and general hospitals. Within these kinds of hospitals, techniques and technology may be found in several parts of the 'medical process', such as in diagnostics, surgery, intensive-care, and various therapies ranging from chemotherapy and radiotherapy to physiotherapy and rehabilitation. Illnesses of the circulation system and malignant tumours, in particular, have given rise to extensive and complex techniques for diagnosis, surgery, medication and therapy.

The three leading development areas in medical technology are micro-electronics and information science, molecular biology, and new materials:

1. *Micro-electronics* is characterized by spectacular advances in theory which have gradually been given practical application, especially in the fields of automation, data processing and communications;
2. Progress in the field of *molecular biology* is equally spectacular and especially relevant for the

prevention and cure of illnesses. The associated biotechnology offers the possibility of materials and techniques which were, until recently, impossible;

3. Progress in the field of *new materials* is especially apparent in the areas of implant and transplant material, and soluble pharmaceutical mediums.

These developments may be characterized as 'impelled by technology itself' ('technology-push'). In contrast, there are developments that come about because there is a demand for them ('market pull'). Demands arise, for instance, because of the aging population, the policy of substituting simpler and more practicable medical techniques wherever possible, and the expansion of domiciliary care (Meducatie, 1989).

10.3. Health care in the Netherlands: sectors, occupations and training

An estimated 400,000 people are employed in the Dutch health care sector. This is almost 6% of the working population. Expenditure on health care, at 8.5% of GNP is almost the highest in Europe. On the other hand, the average life expectancy of 76.8 years is among the highest in the world.

Sectors

A distinction is often made in the health care system of the Netherlands between intramural and extramural health care. The following institutes belong to these types:

Intramural:

- general, specialised and academic hospitals
- psychiatric hospitals and institutions for the retarded
- convalescent homes
- medical children's homes and infant day centres
- institutions for the blind etc

Extramural:

- blood banks, thrombosis care facilities, and laboratories serving general practitioners
- 'basic health' services and the national home nursing service
- mental health care outside of institutions
- pharmacies, general practices and dentists' practices

In this chapter we will limit ourselves to the approximately 200 general, specialised and academic hospitals in the Netherlands, which in 1987 employed about 140,000 people.

Occupations

In the Ministerial Memorandum on Planning for the Professional Work Force in Health care (Nota Beroepskrachtenplanning Gezondheidszorg, 1988), the health care occupations are divided in the following categories:

- | | |
|------------------------|---|
| medical occupations: | <ul style="list-style-type: none">- general practitioners, dentists and pharmacists;- specialists (e.g. <i>anaesthesiologists</i>);- social physicians (academics, advising and researching in the sector);- other physicians; |
| paramedic occupations: | <ul style="list-style-type: none">- various therapists and laboratory technicians;- surgery assistants (e.g. <i>anaesthetic assistant</i>);- nursing occupations;- nurses, nurse-aids, and orderlies;- midwives; |
| auxiliary occupations: | <ul style="list-style-type: none">- pharmacist's, physician's and dentist's assistants. |

In this chapter we limit ourselves to one specialisation, the anaesthesiologists, and to one auxiliary occupation, the operating theatre anaesthesia assistant.

Training

The training structure in the Netherlands' health care system is strongly linked to a profession and in some cases it is rather sector-specific. To qualify for medical professions, the academic study of medicine, dentistry or pharmacy has to be completed, followed by medical finals and a specialisation period lasting some years. For almost all paramedical occupations there are regular and in-service training courses at a Tertiary Education level. For the nursing and auxiliary occupations in health care, there are regular and in-service training courses at tertiary and secondary levels.

Company and Sector Training in health care, in particular in hospitals

In addition to the training for health care at an secondary or tertiary (MBO or HBO) level, which is paid for by the Ministry of Education and Science, there are also in-service training courses provided according to the national regulations and legal requirements of the Ministry of Welfare, Health and Cultural Affairs (WVC). This may be considered as the 'company training' of a hospital. Attention has thus far been given especially to professionally orientated training for general and specialized trainee nurses. Nowadays, however, a tendency to give a training that is more company-focused may be noticed among the members of the Association of Training Institutes for Nursing Occupations (VOVB) (the occupation and function-focused schools of the hospitals). Possibilities are seen especially in further training. Notions such as obtaining

economies of scale, modularisation and task analysis come up as guide-lines for training. There is a multi-media approach in training and the training programmes are being made more flexible and individual.

On-the-job training with the introduction of new technology

The introduction of a new apparatus or a new machine in a hospital is usually overseen by the 'after-sales specialists' of the supplier and by employees of the clinical instruments section. Depending on the new technique, there may be a simple introductory evening and/or more intensive on-the-job training of some of the future users, who will then have to pass their knowledge on to their colleagues. This is one of the reasons why cooperation and good communication and social skills have become more important. It is generally said that relatively little attention is given to the possible consequences for in-service training of the acquisition of new apparatus.

During the normal training of theatre assistants it is not possible to pay attention to the many specific aspects of medical apparatus. In general the number of different suppliers is too large and the equipment varies too much from one institution to the other. Furthermore, it appears to be difficult for the training institutes to obtain modern medical equipment for instruction purposes. Some manufacturers have arranged an instruction car that is available at call. The required further training is either given by the institutions themselves or by the regional training institutes, or by the different occupational organisations.

10.4. Case study anaesthesiology

This section will describe the development of the anaesthesiology field. Then the two main occupational groups, the task contents, some training aspects and some of the problem areas will be outlined. In addition, the responses of the occupational associations and interested groups will be explored.

Short description of the sector

In 1988 about 550 registered anaesthesiologists were employed in the more than 200 surgeries in the country's hospitals, about 140 anaesthesiologists were in training and there were over 1,500 qualified Operating Theatre Anaesthesia Assistants and 282 student Anaesthesia Assistants. Because of them, surgeons have been able to perform over two million operations per year. They have over 1,000 operating theatres with sophisticated equipment at their disposal.

In the Academic Medical Centre of Maastricht/South Limburg there are about 17 operating theatres. There are 17 anaesthesiologists, 6 anaesthesiologists in training, 26 surgical assistants and 5 trainee surgical assistants employed. In 1988 there were no publicly advertised vacancies for qualified anaesthetic assistants in South Limburg.

10.4.1. The development of a new sector

The period between 1945 and 1960

Until WW2, anaesthesia for surgery was performed with chloroform or ether by a physician-anaesthesiologist, supervised by the surgeon. The aim was to give such a good anaesthesia that the surgery could be performed in the best possible way, from a technical point of view. During the war, in England and the US, the specialisation of narcology or stupefaction was developed. In 1946 the first (English) specialist-anaesthesiologist in the Netherlands was appointed at the Public ('Gemeente') University of Amsterdam to give training in the new specialisation. Because of the rapid development of knowledge and technical possibilities, the demand for such specialist help during surgery increased and there was a strong increase in the demand for doctors specialising in anaesthesia. In 1948, shortly after the first doctors had been taken into training to meet this demand, the professional association 'Dutch Anaesthesiologists' Association' (NAV, later NVA) was founded and the specialisation was acknowledged as such by the Specialists Registration Commission (SRC), using the training requirements for the English 'Diploma of Anaesthetics' as a model. In the fifties the NAV applied itself especially to drawing up and adapting the training requirements and determining scales of payment. In those years, the most important apparatus of the anaesthesiologist were the stethoscope and the mercury sphygmometer. Anaesthesia was mainly given with ether and laughing gas, and little attention was given to pre and post surgery care.

1960 to 1980

The second generation of anaesthetists in the sixties and seventies has focused on the full acknowledgement of the new specialisation, involving especially a struggle with regional health insurance boards and hospital boards over technical, financial, organisational and judicial aspects. Apart from this, the 'cutting specialists' in particular were hesitant in acknowledging this slightly competing specialisation. About this period there were also great developments in anaesthetic techniques and substances, respirators, monitoring apparatus and the recording of medical data, partly under pressure from the strong increase in public and political interest as a result of accidents. The work field of the anaesthetist (later anaesthesiologist) started to expand beyond the operating theatre, for instance into extended pre and post care. The second generation of anaesthetists has also been very much concerned with the formulation and adaptation of training requirements. Furthermore, there was an increasing demand for specialized nursing support: the profession of 'operating theatre assistant (anaesthesia)' was coming on.

1980 to the present

Since the early eighties practically every hospital has had an anaesthetics department: the anaesthesiologist is usually no longer working as an independently established specialist but rather in a partnership or as an employee. Thus he has the professional support of theatre assistants. The working field has been considerably extended beyond the operating theatre, in part due to the constantly increasing possibilities in medical technology: pre and post operative care, intensive care, and pain suppression have by now become a part of the anaesthesiologist's duties, and there is a tendency to sub-specialization, for instance in cardio-anaesthesia, neuro-anaesthesia, and in child and neonate anaesthesia. Problems in medical ethics and legal issues concerning, for instance, in vitro fertilization and intrauterine fetal surgery are increasingly encountered. Anaesthesiology, originally a secondary task of the surgeon, has now become a full-fledged professional field where the nurses, technicians, cutting and non-cutting specialists and academics of the pharmaceutical and medical technology industries meet: teamwork has become a self-evident requirement.

Development towards the future

From the beginning of the sixties open-heart surgery has been performed in the Netherlands. The number of operations has increased considerably, especially in recent years. During surgery the functions of heart and lungs have to be taken over by a heart-lung machine, a joint product of cardiosurgery, anaesthesiology and the medical technology industry. This increasingly complex machine was originally operated by a nurse or a theatre assistant, under the supervision of the anaesthesiologist. At present, however, a new discipline of so-called 'perfusionists' is emerging. The Netherlands now has some 100, who have together formed the Dutch Society for Extracorporeal Circulation (NESEC). This professional association has formulated some guidelines for training and professional practice; however, a standard national training is not yet available. The role of 'assistant perfusionist' is also emerging. This assistant is charged only with the functioning and maintenance of the heart-lung machine.

Though less clear, there is also a tendency towards the emergence of a 'clinical technician', with hardware and software knowledge concerning monitoring and data recording in particular. As a result of the development of micro-electronics, various functions (such as measuring, saving, comparing, recording and calibration) may be integrated in one machine. One example is the development of specific monitoring machines by an academic hospital in the Netherlands, in cooperation with a company specialising in these machines. With this machine several parameters can be automatically and simultaneously measured and calibrated, taking over some of the functions of the anaesthesiologist and his assistant. Only the limiting values of the parameters still have to be calculated and programmed.

10.4.2. Occupation and training of anaesthesiologists and assistants

The anaesthesiologist

Responsibilities of the anaesthesiologist:

The anaesthesiologist has the final responsibility for all medical and medi-technical aspects of the anaesthesia and the corresponding administration and elimination of the anaesthetic. Furthermore, he has to give instructions for, or himself perform, every activity except for monitoring. The development of the profession of anaesthesiologist has been practically synchronic with the development of the professional field of anaesthetics.

Training of the anaesthesiologist

The training policy for new anaesthesiologists is determined to a large extent by the professional association (the Dutch Association for Anaesthesiology, the NVA), by the specialists who are qualified to give training, the professors in anaesthesiology and the hospitals they are attached to. Thus the number of training places is mostly dependent on the financial possibilities the trainers and institutes are able to create.

The training of anaesthesiologist occupies a total of some eleven years: six years for the doctor of medicine exam and five years for the anaesthesiologists' examination. After obtaining this examination, registration in the Specialists Register takes place. From 1957 to 1991, 1,027 anaesthesiologists have been registered. In the Netherlands there is no recertification requirement: once registered, no new tests of competence have to be taken. There are however possibilities for further training (see below). In 1961 the so-called Concilium Anaesthesiologicum was called into being by the NVA, for the granting of teaching licences. The basic task of this Concilium is the training and registration of anaesthesiologists, training including the formulation of training requirements and of the requirements for granting teaching licences. Teaching licences are granted to a hospital but are in fact coupled to an individual. Furthermore, the Concilium is concerned with formulating predictions of the number of anaesthesiologists required. The NVA observes - with reservations - that the number of anaesthesiologists required has always been underestimated. However, there are no figures available to support this suggestion.

For years, the duration of the training has been an issue for the profession. The central government and the hospital institutions held to a three year term for many years, although according to the 'Central College for the Recognition and Registration of Medical Specialists' it should have been at least five years (which is now the case). The discussion concentrated

repeatedly on the number of practical training 'sections' and on the theoretical training. The parties involved agreed that the practical training should cover at least three years.

Further training of working anaesthesiologists

Even though, as a result of the rapid development of the field, further training for anaesthesiologists soon appeared essential, this has long been dependent on the individual initiative of some specialist professors. As of 1978, the newly established Central Course for Anaesthesiology (CCA) has been given on a yearly basis. The course consists of four parts, each covering one year. Within the CCA the training of assistants has become interwoven with the further training of anaesthesiologists who are already working: both take part in the same course. The underlying notion is that the assistants get a more practical training because of the presence of specialists and the specialists become more conscious, because of the presence of assistants, that their own theoretical training may be somewhat out of date. In the past ten years or so there has been a discussion going on in the Netherlands about whether this CCA and the corresponding test for working specialists should be made obligatory or not. The Swedish system of recertification, where courses and tests have to be taken, is being considered. However, as yet no definite decision has been taken.

The operating theatre anaesthetics assistant

Responsibilities of the anaesthetics assistant

An operating theatre anaesthetics assistant ensures that all anaesthesiology machines (including the monitoring machines) are ready and systematically checked before each operation, and assists the anaesthesiologist in the administration of anaesthetic methods. This applies equally to surgery in which the patient receives general, or merely local, anaesthetics. In this process the assistant has an important task before, during and after surgery, in monitoring the various bodily functions of the patient, such as respiration, circulation and renal functions.

Development of the area of responsibility and the associated training

In the early twentieth century surgeons were assisted during surgery by nursing sisters and brothers, mostly religious, who had no particular training. The professionalising of the tasks they carried out has led to the occupational category of nurses, with the Nursing Act as protection for their title. With the emergence of anaesthesia as a medical specialisation came the demand for specialized supporting personnel. Until the late sixties nurses with an interest in a role in the surgical department received in-house training from, in general, the specialist and the head of the anaesthetics department. On the initiative of the National Board of Hospitals, a start was made in 1966 to streamline this in-house training. In 1969 a preliminary report on

training as operating theatre assistant was published. In the meantime the Parliamentary Under-secretary of the Health Department had asked the Health Board for advice on the issues of giving anaesthetics to more than one patient at the same time and about the extent of anaesthetic administration by non-anaesthesiologists. As regards this last issue, the committee that was set up took the view that the necessary minimum assistance, without which an anaesthesiologist cannot work, has to consist of 'one anaesthetics nurse per functioning operating table'. The nature of the activities of these anaesthetics nurses, their tasks and responsibilities were then described in detail. Furthermore, an indication was given of the interventions that most certainly could not be done independently by these nurses. The commission, consisting partly of anaesthesiologists, strongly rejected the notion of a 'nurse-anaesthesiologist' who independently gives anaesthetics. The commission also supplied a complete training scheme that would later serve as the foundation for a large part of the National Hospital Board certificate. The first training courses started in 1971.

Training as operating theatre anaesthesia assistants

The training for anaesthesia assistants is a three-year in-service training at a tertiary educational level (HBO). During the training, practice and theory alternate. At the end of the first year of training, the course of further study (surgery or anaesthesiology) is determined on the basis of the suitability of the student and the chances of placing the student in the surgery or anaesthesiology departments. For anaesthesiology the accent is on the subjects physics and chemistry, medical techniques, and general and specialised anaesthesiology. The training is given according to the national Regulation for the Training of Surgery Assistants, which has been approved by the Minister of Welfare, Health and Cultural Affairs. However, a legal framework for training and for the profession is still lacking. The national management of the training is performed by a supervisory commission of the National Hospitals Board (NZR).

When the training as an operating theatre assistant has been successfully completed, and a diploma granted, the assistant is entered in the national register of the NZR. An agreement has been made with Dutch hospitals that only registered theatre assistants may be employed. In actual practice it seems that this agreement cannot always be kept to.

In the Netherlands the training as theatre assistant can be undertaken in 16 places. For the hospitals of southern Limburg the theoretical part of the training is provided at Heerlen College. The entire training is supervised by a regional supervisory commission, consisting of representatives of the training institute and the participating institutions.

Job market for operating theatre assistants

In 1988 there were 284.5 vacancies for theatre assistants. In 1986 there had been 323 vacancies, so the number of vacancies is decreasing. The National Hospital Board's Commission on the Training of Operating Theatre Assistants predicted some years ago that, if there was no change in policy, there would be an increasing shortage of theatre assistants in the coming years. The main reason was that as a result of budgeting a very cautious training policy was being followed, causing the number of students to decrease. Other causes of this shortage were the increase in the amount of work, the increase in the number of part-time workers, and a slight increase in turnover. In recent years, however, the training capacity has again increased. Also a lot of attention has been given on the one hand to the refresher training of working and already qualified personnel and on the other hand to training to facilitate and stimulate the re-entry of qualified theatre assistants. Meanwhile, in early 1991, a study by the National Hospitals Board of hospitals and medical institutions has shown that the shortages are less than was expected some years ago, although recently the media have given ample attention to some hospitals that temporarily closed their operating theatres because of vacancies that could not be filled. Qualified foreigners are occasionally employed.

10.4.3. Qualitative problems and strategies

The anaesthesiology profession would not have developed without medical technology. In the course of the professionalising and the development of differentiated professions, however, the interrelated organisational, ethical, legal, financial, training and insurance aspects have played a part. Although the potential of medical technology is always limited by these factors, there has been enormous progress. Some of the qualitative problems will be discussed below.

During the development of anaesthesiology as a profession the medical specialists in particular (surgeons, anaesthesiologists, cardiologists), together with the pharmaceutical and medical-technology industries, have been the ones to develop technical discoveries and to introduce them to the operating theatre. Because of the increasing technical, medical and financial possibilities a number of supporting professions are developing. However this causes tension in the current division of responsibilities and authority.

Division of responsibility and authority between the anaesthesiologist and the assistant-anaesthesiologist

The question of the desired and acceptable relation between the patient, the specialist and the assistant during anaesthesia has been an important issue in anaesthesiology for several decades. The first anaesthesiologists initially gave anaesthetics to one person at a time: the so-

called 'one-table system'. But because of the great demand for 'modern anaesthesiology' that quickly arose, and because of the shortage of anaesthesiologists, it has long been impossible to comply with this system. A 'flexible one or two-table system' emerged: depending on the presence of sufficient machines, qualified assistance, and on the condition of the patient, the anaesthesiologist may conduct more than one anaesthesia at a time. The Chief Medical Inspector has said that "the decision to administer anaesthetics to more than one patient at a time is a matter for the professional responsibility of the anaesthesiologist. The administration of anaesthetics to two persons at the same time must however be considered undesirable. Furthermore, the anaesthesiologist must at all times be assisted by a sufficiently trained assistant; he must take care of the administration and elimination of each anaesthetic himself and he himself must order or carry out every task, except for the actual monitoring, and he must, at any moment he may be needed, be there to intervene." In daily practice, however, there appear to be many possible situations which may prevent this standard being achieved. Because of the considerable increase in information and communication possibilities (intercoms, monitors, etc.), an anaesthesiologist is more able to oversee and guide more than one table at a time.

The administration of medical treatments is of vital importance in the division of tasks between a doctor and an assistant. According to the Law on Medical Practice (Wet op de Uitoefening van de Geneeskunst) medical operations such as the introduction of a catheter into a body cavity, the positioning of the body on the table and the administration of medication may only be performed by medical professionals. In actual practice, this law is broken all the time, because theatre assistants also, unavoidably, perform these tasks. This was the reason for the legal construction of the 'extended arm': an assistant was only allowed to perform a medical act which is forbidden according to the law and the resulting insurance regulations, if this was done by the instructions, and under the supervision of, a physician. In emergencies they could act on their own judgement. But this construction also appears to be unworkable in actual practice: if an anaesthesiologist cannot be consulted immediately, there is no more question of an extended arm and the assistant then carries too much medical responsibility. Adjustments to the present legislation or the development of professional legislation especially for theatre assistants are not expected for the moment, due in part to the stand on principle taken by the anaesthesiologists ("no medical treatment by assistants"). As a result of this, many theatre assistants find themselves in a permanent conflict between the progress of the operating schedule, the optimal care of the patients they are responsible for, and the limits of the law. A National Hospital Board study among theatre assistants (1990) also showed that many find the lack of coherence between the admission policy and the capacity of the operating theatres to be a problem.

Comparison of training policies

To a large extent, the training policy for both professions is determined internally. Through the Dutch Association for Anaesthesiology (NVA) and the Concilium Anaesthesiologicum that is linked to it, the medical specialists and anaesthesiologists have the training policy (demand, capacity, qualifications, preliminary training, contents, duration, financing) mainly in their own hands. The Parliamentary under-secretary for the Health Department has at the most the role of regulating after the fact. The possibility of control has increased a little because almost all hospitals have now entered an employer-employee relationship with a practice.

In contrast, the relatively young profession of operating theatre assistant and its corresponding training are to a large extent subjected to the regulations and agreements of professional bodies, hospitals, and the Health Department, so far as training capacity, requirements, and so forth are concerned. This is all the more possible because an assistant anaesthesiologist mainly provides support and follows techniques: he does not have to be informed about, or contribute to, the latest medical techniques, as a specialist does. This means that more general accepted techniques suffice as training. The theatre assistants and trainee assistants are employed by a hospital and their training is paid for from the training budget of hospitals. The hospitals discuss the training requirements and capacity at a national level, through the National Hospital Board commission for the Training of Operating Theatre Assistants and in consultation with the Ministry of Welfare, Health and Cultural Affairs. Both training programmes were developed from the work of a commission, consisting for the larger part of anaesthesiologists, which produced a task inventory and task analysis and then came up with a proposed training scheme.

10.5. Conclusion

In the sector of anaesthesiology there is a very clear relation between the professions and the training which supplies their personnel. Moreover, the sector offers a limited number of positions, spread over about 200 medical institutions in the country, making it a limited professional market. In addition, this is a relatively young, rapidly growing professional group, which accounts for a low replacement demand. These factors lead to low mobility, which cannot be significantly changed by company training or Management Development programmes. However, there is a great need of regular further training, a need which is still growing because of the continuing developments in medical technology.

11. SUMMARY AND BRIEF COMPARISON

11.1. Introduction

Sections 2 to 6 of this chapter give a summary of the case studies that have been described in the chapters 6 to 10. Section 7 reviews some of the differences in the labour market, training and educational policies in three of these sectors: the metallurgic industry, the printing industry and the health care sector.

11.2. Customs clearance agencies

Present situation

The customs clearance agency is an intermediary between the consignor and the conveyor, and derives his function from the controls and formalities that have to be complied with at the borders as a result of the differences in legislation between countries. The employees charged with this work are called customs clerks ('declarants'). In the province of Limburg around 600 customs clerks work in customs clearance agencies.

Two developments in particular put pressure on the position of customs clerk: the first development is the increasing use of systems for electronic data processing: Electronic Data Interchange (EDI). Because of those systems, data no longer has to go by complicated routes in the form of written documents, but can be immediately exchanged electronically. For customs clerks, EDI means less administrative work as a result of the electronic filing of declarations. On balance, employment for customs clerks has increased as a result of a second development: the pursuit of one common European market. The gradual lifting of Europe's internal borders has already led to an increase in the international transport of goods. This means that the work pressure on customs clerks has greatly increased.

Problem areas

The two developments above have on balance led to a growth in employment for customs clerks in the short term. In the long term, however, they will constitute a threat to the employment of customs clerks. Their function will be increasingly undermined when, as a result of the European integration policy, more and more border controls and formalities are shifted from the internal borders to the external borders of the European Community. Apart from that, the border will no longer be the necessary place of business. Even though it is expected that

the transport and customs clearance sector as a whole will profit from the abolition of border formalities, the future for customs clerks looks gloomy. When, in the longer term, community integration of the computer systems of Customs Services has taken place, and goods declarations are entirely automated, the position of the customs clearance agent will be affected even more. There is reason to fear the loss of 300 to 400 jobs in the Limburg customs clearance sector.

It appears to be inevitable that the customs clearance agencies will have to take on new activities. A solution could be found in broadening the tasks of a customs clearance agency to include those of a freight forwarder or even of a forwarder/conveyor. It is not clear in what precise direction within the logistic service sector they should expand their operations, in the light of the increasing vagueness of the traditional boundaries between the consignor, conveyor, and forwarder. Another development is that consignors are contracting out transport and forwarding tasks to transport and forwarding companies, which has led to their attaching ever more importance to the quality of transport and forwarding services. Quality is also becoming more important in the light of the increasing international competition within the common European market. The transport and forwarding sector in a country with relatively high wages such as the Netherlands can only survive this international competition from low-wage countries by offering higher quality. Reliability and speed are key notions, especially for companies who have adopted Toyota's Just-in-Time inventory policy. Such a system makes high demands on the quality of labour. The problem here is that theoretic training in the sector has up till now been second to gaining practical experience in a working situation. The number of employees with an Intermediary or Higher Vocational Education (MBO or HBO) is therefore relatively small in this sector. Thus far, this practical method of occupational training has been successful, but considering the developments described above, an improvement in the qualifications of current and prospective personnel is essential to maintain and increase employment in the sector.

Problem-solving strategies

The threat to the employment of customs clerks has led to the establishment of a training and personnel recruitment project for the customs clearance sector in Limburg. The initiative for this project was taken by the regional Business Advisor for Training for North Limburg, who is connected with the North Limburg Chamber of Commerce in Venlo. He has established the project together with the Regional Labour Bureau in Venlo. The training project aims at retraining or giving further training to the current and new personnel in the customs clearance sector, with an eye on the development of the European internal market. The project has three components:

- 1) training, retraining, and recruitment of new staff;
- 2) in-service training and continuing education for current staff in the customs clearance agency sector to combat high staff turnover;
- 3) broadening the range of training offered to the transport and freight forwarding sector to make 1) and 2) possible.

The entry of new staff is required to diminish the work pressure in the customs clearance agencies and thus to create room for study leave for the current staff. Therefore enough qualified staff will have to be recruited and trained. Since there is no future for the function of customs clerk due to the lifting of the internal European borders, the training of incoming staff has been broadened.

Retraining and additional training of customs clerks already working in the sector is essential if they want to be broadly employable in other functions within the sector after 1992. In order to stimulate this, two measures have been taken. In the first place, the diverse training possibilities already offered in the region have been made more accessible for current personnel. Apart from that, two new vocational training possibilities at Intermediary level have been created, aiming at the training of current personnel.

11.3. Office automation

Current situation

Office automation starts with learning to employ electronic aids (gaining PC experience and word processing ability). After some time, an office will be completely "automated", meaning that the 'old' secretarial tasks will be performed with the aid of computers. There will be room for the development of new tasks, such as information handling and filing, organizing the data flows logistically and making them accessible to the users, and achieving professional standards in communication with the outside world.

In the outline above, the following degrees of computerization can be distinguished:

- Partial computerization: the activities have been automated separately, but have not yet been computerized in combination. 'Stand alone' equipment (word processor and PC) is used, along with terminals which use a central computing capacity.
- Integral computerization: the data systems have been connected to each other and function integrally. PCs able to communicate with each other via a central computer are used. There is an internal computer network.

- Telematization: internal computerization is integrated with telecommunication. There are 'on line' connections with various data transmission and communication networks (via telephone, cable and satellite).

Because of partial computerization there is still a lot of extra training being carried out in areas such as PC operation and word processing. After the first wave of extra training of enthusiastic, generally young employees with an open attitude to this new technology, the current phase is concerned especially with somewhat older employees who take part in technology training more or less out of necessity. The demand for this type of training will decline, since learning how to operate electronic aids has meanwhile been well integrated into basic training. Adaptation to new hardware or software is then more a question of an afternoon of 'instruction' than of extra training. The extra training may be directed more at 'new' administrative needs that arise in an office that has completed the automation process: unlocking of data, filing, managing office logistics, cost management, command of languages. There appears to be room for courses at a higher entry level, directed at these new tasks.

Problem areas

The most important development in this sector has been the increasing use of systems for electronic data interchange (EDI). Because of these systems, information no longer has to go in the form of documents by complex routes, but can be electronically exchanged between different organisations without delay. As a result of the introduction of EDI systems, certain office activities disappear, while others change and new ones are created.

The disappearance of office jobs

The new information technologies and the related reorganisations are a threat especially to jobs that involve routine support tasks requiring hardly any qualifications. This relates especially to data-input tasks. Furthermore, an increasing number of jobs are disappearing in office sections in which, traditionally, a lot of written material circulates, or in which it has had to go by complex routes.

The transformation of office jobs

One general development has been the breaking down of traditional boundaries between specialized occupational categories. Bank clerks, for example, are developing in a commercial direction and in the direction of advising clients.

The creation of new office jobs

New functions are often created in posts whose function is to make information technologies more relevant for the user, that relate to the control of the information system, to the organisation of information flows (information logistics), or that involve supporting, or providing instruction for, day-to-day work. The Centre for Office Automation, for instance, argues that there should be training available for 'office analysts'. The task of this new functionary would be to structure office activities, in particular routine activities (organizing in order to computerise). He or she would therefore have to focus on the social and technical aspects of office automation (organisational and procedural consequences) in order to achieve more efficient utilisation of the available hardware and software.

Problem-solving strategies

EDI makes it possible to provide services made-to-measure for the individual customer. Office work in the service sector is becoming more and more customer-orientated and requires ever greater social skills on the part of the office personnel. Furthermore, office personnel are increasingly confronted with non-routine tasks that make high demands on their problem-solving skills. Because of the introduction of new technology, more is asked of the learning abilities of office personnel. Considering these qualification requirements, the preliminary schooling system, as well as the system of sector and company training, have to ensure that the great majority of those completing their training possess these skills. Sizeable companies have the choice of setting up internal company training programmes or contracting out specific training activities. Small and middle sized companies, however, can in the short term only seek someone who offers the required training programme. In the longer term, they could set up a joint training centre or ask a training institute to develop a specific training programme. In Limburg a training centre was created, the Centre for Office Innovation (CKI). The CKI was founded in 1984 as a non-profit foundation. The basic goal was to offer training to job-seekers who used to have an administrative function (i.e. to the unemployed and to women re-entering the workforce). In addition, the CKI would provide training for working people, including school-teachers. The establishment of the CKI was the result of a joint initiative from a number of companies in Limburg, and the local government and Bureau of Labour in Venray. Since its foundation in 1985, the CKI has progressively focused less on job-seekers and more on the training of working people.

11.4. The printing and graphics industry

The Current Situation

The printing and graphics sector has long been a clearly defined, highly organized sector in which employers and employees jointly formed and put into place training and labour market policies by consulting and coordinating their efforts. This took place within the framework of a differentiated occupational market, fixed working conditions, and other 'closed shop' rules (concerning entry, internal mobility, and exit). By the end of the sixties the structure of the occupational market appeared to be no longer viable, due to changing production methods as a result of technological developments (especially in the pre-press and printing phase) and the disappearance of old functions and the emergence of new ones.

Although the unions were reluctant, in the early seventies, to change this labour market structure, after years of preparation and negotiation they finally agreed to a restructuring of this system. The 'New Themes' structure (1978) consists of two training levels, relating to six new wage groups, within which forty different functions are distinguished. The employers, however, wanted a rapid and on-going diversification in, and increase in the flexibility of, functions and function levels, and less rigidity in the 'closed shop' rules, which had already become more open due to the increasing diversification. Their demands were largely met during the 'second restructuring' in the early eighties. At the moment the printing and graphics industry in the Netherlands employs around 50,000 people, in 2,750 companies.

Problem areas

In spite of the developments described above, the printing industry is still a very transparent and structured market. The sector is very well informed and documented, and has a great degree of openness and accessibility, supported by all of the organisations involved.

Nevertheless the Printing Industry Employment Bureau (BWGI) and the Print Training Centre (GOC) foresee a number of problems in the coming years:

- 1) a shortage of technically trained personnel (especially colour technicians, scanner operators, offset printers and final processors) because of a growing demand for replacements (5% of current staff, or 1,750) and a rather lower demand due to expansion (1%, or 350);
- 2) a shift from manual skills to skills relating to automated processes, because of growing automation/computerization, especially in pre-press functions;
- 3) the unfamiliarity of the public with the printing and graphics sector;

- 4) insufficient differentiation in the training on offer;
- 5) a shortage of information about developments on the labour market;
- 6) regionalization of labour supply management.

Problem-solving strategies

The following measures have been proposed in response to the 6 problems described above:

- 1) To increase the entry of school graduates, special target groups and other trained people, and to increase the training capacity of companies, the plan is to initiate mailing and publicity campaigns and to approach individual companies with a concrete training plan.
- 2) To improve the movement of personnel into new functions, and from auxiliary functions into technical and administrative roles, it is intended to develop and offer new training, accompanied by information and experimental projects.
- 3) To increase the familiarity of careers advisors, student counsellors and Bureaus of Labour with the printing industry, a publicity plan and network will be established.
- 4) Diversity in the training offered ('made-to-measure training') must be achieved by conducting more, and more frequent, research (some of it on a regional basis), into training needs, and by up-dating time and organisational aspects of training, and increasing flexibility.
- 5) The BWGI wants to obtain a better insight into possible future imbalances in the printing industry labour market, resulting especially from external developments, by working more with (or investigating the possibility of) flexible scenarios rather than static predictions.
- 6) In view of the decentralization and reorganisation of labour supply management, a reorientation of the printing and graphics sector is desirable. The regional division of printing and graphics training institutes and the employers' organisations and unions, for instance, does not match with the new regions of the Regional Boards for Employment.

11.5. The metallurgic sector

The current situation

In general the metallurgical sector makes a distinction between the metallurgical and electrical industry (more than 30 employees) and metal-working concerns (less than 30 employees). The metallurgic sector is very heterogenous and sensitive to economic fluctuations. As a result of economic and technological developments in the last few decades, a large number of jobs have disappeared. From 1980 to 1988, the labour volume declined by 40,000 labour years to 370,000.

The technological developments in the metallurgic sector relate especially to the automation and computerisation of the preparation, execution and finishing off phases of the production process. Some large scale investigations showed that the new production technology is not the only factor that leads to changes in function and qualification structures. The characteristics of the company structure and of its labour organisation, the nature of the vocational training that is offered, and of internal mobility and recruitment, also play an important role.

Changes in the function and qualification structure can be seen in the integration of some functions and the specialization of others, as well as in the displacement of less trained by more highly trained staff and the substitution of workers with other training. The rate and degree to which these changes occur depend on the tempo and phasing of the innovation process.

Company characteristics such as the size of the company, type of production process, innovative ability, and degree of participation in training activities are important variables which may explain the existence or absence of market imbalances (e.g., differences between training and work experience sought by employers and that offered by job-seekers). In one section of a research project on Education, Training, and the Labour Market in the Metal-working Industry (the OSAM project), the researchers made a typology of companies. It is remarkable that a limited group of 'traditional' companies (middle-sized but growing, and only slightly innovative) pay relative great attention to training. More, in any case, than the so-called 'modern' companies (large and innovative), and far more than the majority of the 'traditional' companies. The training participation of 'backward' companies (small companies and one-man businesses, not automated, non-innovating) appears to be zero.

Employees working in 'modern' companies are more likely to think they are working under or above their training level than employees in 'traditional, not training-orientated' companies. They also think more often about changing jobs. For that matter, the internal mobility (entry and promotion) in training-orientated companies in the metal-working industry appears to be considerably higher than in non training-orientated companies. On the other hand, companies which are not training-orientated are much more likely to have hard-to-fill vacancies.

As for the recruitment of new personnel, attention has shifted in recent years from experience requirements to training requirements. According to the OSAM research mentioned above, companies belonging to the 'modern' type have the greatest recruitment problems, relating especially to welders, sheet metal workers, and fitters and turners at the level of all-round tradesman or workers with intermediary technical education (MTS). There may be a connection with the fact that these businesses are often concerned with production-line processes. This

work does not generally match the traditional occupational image and desired career of an MTS trained employee.

In 'modern' companies work experience is often lacking among the all-round tradesmen and trainee tradesmen. In the more 'traditional' type of company, however, there are relatively more older, unskilled and partly skilled employees with a great deal of experience but little education.

Problem areas

The metallurgic sector is struggling with mainly quantitative problems at the moment. A recent study by the employer's union for the metallurgic industry (FME, 1989) shows that 70% of the companies surveyed had vacancies, of which, according to the employers, 60% could be considered hard to fill. This appears to be the case especially in the Randstad (the urban conglomerate in the west of Holland) and relates especially to skilled workers such as qualified welders and CNC fitters and turners. Moreover, more than 60% of the employers expect a growth in the number of employees in the short term, again relating especially to skilled workers.

Some causes can be given for these quantitative problems:

- 1) the sensitivity of the metallurgic sector to economic fluctuations;
- 2) the working conditions;
- 3) the relatively high exit rate from this sector;
- 4) the low value assigned by employees to their chosen occupation;
- 5) the primary and secondary terms of employment, (i.e., wages, and other incentives and conditions);
- 6) society's undervaluation of craftsmanship in metal.

Problem-solving strategies

Over 70% of the companies considered increasing the opportunities for women in production functions as a possible solution. Other possibilities are reductions in absenteeism, now almost 9%, and giving more attention to the recruitment of groups whose numbers are increasing, such as young people from immigrant backgrounds. The sector has also initiated a large-scale information campaign and employs sector advisors to interest school-going youth in training and a career in the metallurgic industry. To maintain a competitive position with other sectors, the metallurgic sector will have to improve its image and working conditions.

The study "From underprivilege to opportunity" was conducted as part of the OSAM project. The question in this research was how the recruitment of the long-term unemployed (more than 2 years) into the metallurgic sector could be improved by training. On the basis of this research it became clear that entry or reentry possibilities can only be increased if everyone involved is prepared to make an extra effort. The policy recommendations have been worked out in a 'step by step plan', including recommendations in the areas of information supply, coordination, labour-pools, training and motivation, employment agency work and follow-up, and process and product evaluation.

11.6. Technology in the health care sector: anaesthesiology

The current situation

The development of the field of anaesthesiology has taken place mainly as medical specialists (surgeons, anaesthesiologists, and cardiologists) have developed new techniques together with the pharmaceutical and medical technology industries and have introduced them in the operating theatre. Because of the increasing technical, medical and financial possibilities, a number of auxiliary occupations have been able to develop. This leads to tensions in the existing division of responsibilities and authority.

The division of responsibilities and authority between the anesthesiologist and the anaesthesia assistant

The question of the desired and acceptable relation between the patient, the specialist and the assistant during anaesthesia has been an important issue in anaesthesiology for many years. The first anaesthesiologists initially gave anaesthetics to one person at a time: the so-called 'one-table system'. But because of the great demand for 'modern anaesthesiology' that quickly arose, and because of the shortage of anaesthesiologists, it has long been impossible to comply with this system. A 'flexible one or two-table system' emerged: depending on the presence of sufficient machines, qualified assistance, and on the condition of the patient, the anaesthesiologist may conduct more than one anaesthesia at a time. The Chief Medical Inspector has said that "the decision to administer anaesthetics to more than one patient at a time is a matter for the professional responsibility of the anaesthesiologist. The administration of anaesthetics to two persons at the same time must however be considered undesirable. Furthermore, the anaesthesiologist must at all times be assisted by a sufficiently trained assistant for each anaesthesia; he must take care of the administration and elimination of each anaesthetic himself and he himself must order or carry out every task, except for the actual monitoring, and he must, at any moment he may be needed, be there to intervene." In daily practice, however,

there appear to be many possible situations which may prevent this standard being achieved. Because of the considerable increase in information and communication possibilities (intercoms, monitors, etc.), it is quite possible for the anaesthesiologist to keep a watch on and manage more than one table at a time.

The administration of medical treatments is of vital importance in the division of tasks between a doctor and an assistant. According to the Law on Medical Practice, medical operations such as the introduction of a catheter into a body cavity, the positioning of the body on the table, puncturing the skin, and the administration of medication may only be performed by medical professionals. In actual practice, this law is broken all the time, because theatre assistants also, unavoidably, perform these tasks. This gave rise to the legal construction of the 'extended arm': an assistant was only allowed to perform a medical act which is forbidden according to the law and the resulting insurance regulations, if this was done on the instructions, and under the supervision of, a physician. In emergencies they could act on their own judgement. But this construction also appears to be unworkable in actual practice: if an anaesthesiologist cannot be consulted immediately, there is no more question of an extended arm and the assistant then carries too much medical responsibility. Adjustments to the present legislation or the development of professional legislation especially for theatre assistants are not expected for the moment, due in part to the stand on principle taken by the anaesthesiologists ("no medical treatment by assistants"). As a result of this, many theatre assistants find themselves in a permanent conflict between the progress of the operating schedule, the optimal care of the patients they are responsible for, and the limits of the law. A National Hospital Board study among theatre assistants (1990) also showed that many find the lack of coherence between the admission policy and the capacity of the operating theatres to be a great problem.

Problem areas

In the anaesthesiology sector there is a one-to-one relation between the professions and the training which supplies their personnel. Moreover, the sector offers a limited number of positions, spread over about 200 hospitals in the country, making it a clearly defined professional market. In addition, this is a relatively young, rapidly growing professional group, which accounts for a low replacement demand. These factors lead to low mobility, which cannot be significantly changed by company training or Management Development programmes. However, there is a great need for regular further training, a need which is still growing because of the continuing developments in medical technology.

Problem-solving strategies

The scope for managing these problems through personnel recruitment policies is limited because of the heavily regulated and professionalised structure of this sector. New employees can only be recruited if they have the required qualifications. Professionalization therefore introduces a high degree of inflexibility. The problems can only be managed through training and education.

To a large extent, the training policy for both professions is internally determined. Through the Dutch Association for Anaesthesiology (NVA) and the Concilium Anaesthesiologicum that is linked to it, the medical specialists and anaesthesiologists have the training policy (demand, capacity, qualifications, preliminary training, contents, duration, financing) mainly in their own hands. The Parliamentary under-secretary for the Health Department has at the most the role of regulating after the fact. The possibility of control has somewhat increased because almost all hospitals have now entered an employer-employee relationship with a partnership.

The relatively young profession of operating theatre assistant and its corresponding training are to a large extent subjected to the regulations and agreements of professional bodies, hospitals, and the Health Department, so far as training capacity, requirements, and so forth are concerned. This is all the more possible because an assistant anaesthesiologist mainly provides support and follows techniques: he does not have to be informed about, or contribute to, the latest medical techniques, as a specialist does. This means that more general accepted techniques suffice as training. The theatre assistants and trainee assistants are employed by a hospital and their training is paid for from the training budget of hospitals. The hospitals discuss the training requirements and capacity at a national level, through the National Hospital Board Commission for the Training of Operating Theatre Assistants and in consultation with the Ministry of Welfare, Health and Cultural Affairs.

11.7. Review: some differences between the metallurgic industrie, the printing industry and the health care sector

In the metallurgic and metal-working industry there is hardly any specific, sector-orientated regulation. To a certain extent, the sector may be considered to be an unregulated, free market without entry barriers. Moreover, the fact that the sector is very sensitive to economic fluctuations does not stimulate internal cooperation. During the last recession, the vast majority of the company schools were closed down: training was considered a task of the authorities. Ever since the early eighties, when the metallurgic sector was picking up but personnel

recruitment problems were increasing, the sector again paid attention to structured education (the apprenticeship system) and in-company training. Despite the fact that the metallurgic sector is known for its strong, externally orientated, sector-organisations (especially in promoting its interests), cooperation within the sector is not very extensive.

In the printing industry and within printing businesses on the other hand, there has always been a 'closed shop attitude' and a high degree of internal regulation: issues relating to the labour laws, such as entry, mobility, exit and discharge have been internally regulated, and controlled by internal arbiters. The organisation of the sector also used to be internally directed. The sector has always paid a lot of attention to education and training. The sector has also kept matters such as research and labour 'brokerage' in their own hands. This enabled the printing industry to actively anticipate technological developments, in contrast to the metallurgic sector.

The medical sector is subject to internal regulation (medical disciplinary rules, rules concerning training and occupational qualifications) as well as external regulation (laws and regulations on the quality of training and on professional practice). The case study intended to point out that the authorities practically always lag behind in making regulations for new medical technology and the related occupational and training aspects. Apart from that, ethical, financial and insurance factors play an important role in the development of the sector. The content of the training and additional training of physicians and supporting personnel is largely left to the occupational organisations and to the umbrella organisations of health care institutions. The number of training positions for medical specialists and assistants is determined by the individual hospitals or specialists. Professionalization in this sector has meant that there are few lateral alternatives. This limits the flexibility of employees as well as employers. One characteristic difference, as compared to the labour regime in the printing industry, is that the access to and content of the occupations is regulated by the professionals' own organisations and not by a strong sector organisation.

12. RECOMMENDATIONS

12.1. Introduction

On Friday February 22nd the seminar 'Technology, Qualification and Training in Limburg', forming the third phase of the EC Skills Shortage Project, was held. Forty experts drawn from the regional business world, national and provincial government, Boards for Employment Policy, training institutes, employment agencies, and research institutes took part. A significant number of these participants had already been approached in the course of the preliminary study and case studies.

The seminar had the nature of a meeting of experts, with the intention of gaining new insights in the following areas:

- What demands do technological developments make on the qualification structure of the future labour supply?
- Are education and training able to contribute to countering and preventing discrepancies on the labour market? If so, how?

The aim of the seminar was to formulate concrete policy recommendations, on a regional and national level.

The participants in the seminar had received a resumé of the draft report from the research some weeks prior to the seminar. During the seminar four short introductions to the problem area were given. After this, four work-groups had a one and a half hour discussion concerning what the authorities, training institutes, and the business world itself should do to tackle the current and expected problems. The description of the problems and the policy recommendations which follow are largely based on the results of this seminar.

12.2. Business world

Background

There are a number of structural factors which mean that training policy will become ever more important. One important factor is demographic developments. The entry of schoolleavers to the labour market will decrease by around 30% over the next 10 years. Since changes in the occupational structure were in the past largely due to newcomers on the labour market, this makes extra demands on the readiness of the current working population to train and to be mobile, and on the training efforts of the business sector and the authorities. A second factor relates to the speed of technological developments. There are reasons to believe that these

developments will be increasingly far-going and rapid. Qualifications therefore rapidly become outdated. Training is necessary to keep pace with technological developments. Although this is an accepted point of view in the professional literature, in daily practice most companies do not yet seem to consider training and personnel policies as an essential part of strategic management policy.

Points of departure

- * Businesses themselves are responsible for the development of qualifications within their own companies.
- * Training is no universal remedy for personnel supply problems.

Problems observed

- * The business world is not able to effectively translate the required profile of a function into training requirements. In addition many companies do not look ahead sufficiently.
- * The less skilled constitute a specific problem group. As a result of automation and changes in their tasks, they run a greater risk of effectively losing their qualifications, and of being dismissed.
- * The third problem relates to the fact that companies fear loss of production as a result of giving personnel additional training in company time. Training possibilities are therefore particularly limited in small and medium-sized businesses.

Recommendations

- * There should be more information available on the current and future qualification requirements coming from the demand side, on the one hand, and the development of the qualification structure of the working population on the other hand. This information should be regionally available. An important way of achieving this is to improve the compatibility of personnel information systems, especially with regard to the definition and classification of function and training data. Companies should supply this kind of data on personnel for the sake of focused labour market research.
- * Development of Human Resources Development programmes within companies: employees and prospective employees should be made familiar with flexible working methods and job rotation from the start.
- * Promotion of cooperation within the sector, especially between the smaller companies, for example by establishing training and technology centres and by creating funds and collective training programmes within the apprenticeship system. This requires a more open attitude to the problems, involving also openness with competitors.
- * The business sector should participate more actively in policy making in the field of vocatio-

nal training. This joint responsibility for education should also be expressed in measures such as the creation of positions intended to help poorly trained young entrants to develop and the creation of trainee posts for teachers and students.

12.3. Training institutes

Background

Chapter 5 has outlined what strategies those providing training could follow in order to safeguard the market position of the qualification they offer. In the first place, they can focus on the more exclusive supply of the qualifications required. By changing the curriculum, they can try to offer a course which is made-to-measure for the current demands of the labour system which is their customer. In so far as they can meet their customers' needs more precisely than other alternatives, they will obtain the benefits of exclusiveness. This solution seems to be important especially for those offering training at the lower end of the educational system, for whom exclusiveness is the only way to compete with other varieties of training. However whether or not this is possible depends to a large extent on the rate of technological change and the response time required from the educational system. It is perhaps more important therefore to try to increase quality control. This can be achieved by more rigorous selection criteria, on the one hand, and by giving extra attention to weaker students on the other hand, so as to be able to guarantee a higher minimum level.

Points of departure

- * The educational system has its own responsibility to offer students the best possible start on the labour market; this does not necessarily have to correspond with the wishes of the business world.
- * Precisely this responsibility demands that the system cannot shut itself off from what is happening on the labour market. A more market-orientated functioning of the educational system prevents isolation in the world of education.

Problems

- * Vocational training works with out-dated information and understandings of the content of occupations and tasks.
- * A 'market culture' is lacking in preliminary education; one could say that teachers are self-satisfied and lack motivation.
- * The working conditions in education, with their strong accent on the seniority principle, have a paralysing effect.

Recommendations

- * Education should give more attention to quality control, for instance by a more systematic evaluation of its final product.
- * Curriculum development and the classification of qualifications should be directed more at the contents of students' future work and less at the contents of disciplines.
- * Schools should be offered more possibilities to develop contract training activities.
- * Schools should be offered more possibilities for additional training and trainee posts for teachers.
- * Vocational training should strive for a better integration of theory and practice by introducing a dual system, at least at the lower and intermediary levels.
- * The organisation and management of education should become more autonomous.
- * Training institutes should involve businesses more in curriculum development.
- * The regulations regarding the hiring, discharge, and training of teaching personnel should be made more flexible.

12.4. Governmental authorities

Points of departure

- * The authorities are responsible for the quality of basic schooling.
- * The authorities cannot take over the responsibility of companies where it concerns specific training.
- * The authorities should pursue an integrated and decentralized policy focusing particularly on the infrastructure and other prerequisites.
- * The authorities should not interfere with the contents of training policy. This is a matter for those who offer training and those who have a demand for labour.
- * The authorities should direct their attention to the spread of training opportunities and the stimulation of cooperation between education and the business world.
- * Enlarging the autonomy of schools may not result in the market for training courses becoming less transparent.
- * The EC appears to have only a limited role in this field.

Recommendations

- * The qualifications taught should be spelled out in well defined national or sectoral terms.
- * Quality control should be enhanced not only in higher education but also in lower and intermediary vocational education.
- * Investment in go-between organisations (translation points) between the business world and training institutes, to stimulate the communication between the two. The installment of

labour market information systems both national and regional.

- * Individuals should receive financial encouragement to make a more market-orientated choice.
- * Support should be offered to companies in the creation of growth functions for poorly trained young entrants.
- * The most important technologies should be concentrated in one place within the region. This creates a magnetic effect.

The EC should take action in the following areas

- * Give structure to the qualification system which is in use, with an eye to the interchange and free circulation of personnel.
- * Promotion of transnational cooperation in a number of Euro-regions in the field of training, labour supply management, the development of labour market information systems, etc.
- * Support for the internationalisation of vocational education and training in terms of content, and for the exchange of information about approaches in use elsewhere in Europe.

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